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We like him and his book. He is a gossip,—his absurdities are enunciated in all good faith,—you shake hands with his pride,—you forgive his inveterate habit of self-laudatory chatter, for the sake of his savoury meats and his most righteous anathemas upon the monotony of London suppers. Who would not subsist upon Arcadian acorns, Argive pears, or Persian nuts, with as sincere resignation as upon the changeless broiled bone, the immutable chop, the ancient and barbaric kidney? Is it not a golden chapter that unfolds the secret of an originality in suppers? The gratitude of all good men is due to M. Soyer. He looks down upon the obsolete ways of the kitchen as though they were fit only for Plato's “polity of swine”: we verily believe that he could pickle an owl more successfully than an Egyptian of the time of Rameses, and that he could have pleased the Attic taste with a dish of oysters and mallow, sea-dog cutlets, or Delphian fritters. Between such a professor and the mere scorcher of beef and soddener of potatoes the difference is as immeasurable as between the artist fluting a Corinthian pillar and the savage putting up the corner pole of a hut. No wonder, then, that

M. Soyer was honoured like a prince in the East of Europe, and admitted into the Sultan's effulgent saloons. He had come out as a reformer, a philanthropist,—the male parallel of Miss Nightingale,—the doctor of succulence,—the physician who was to take in hand the soldier after he had done with medicine,—feed him, fatten him, and lead his intellect to a discrimination between lumpy jerks of beef, not fit for Samoyedes, and palatable though plain ragouts. No one will dare tell us that cookery is a superfluous art, or that the unsophisticated flesh of brutes needs no preparation or concomitants to convert it into a foundation for the bone and muscle of a trooper. The Pampas horseman puts a piece of beef between his saddle and his horse's back, rides upon it all day, and devours his meal in the evening; and Sir Francis Head tells us he cannot show an inch of calf. A rice-fed Brahmin would knock him down. The New Zealanders are the most powerful race in the Southern Ocean, but then their cookery would please Apicius.

Not to forget M. Soyer, however,—in this book is set forth how he went to the Crimea, and what he did there. He had been at Drury Lane with a baronet or knight, and was asked to sup at the Albion. Missing his appointment, he fell into a colloquy with a waiter, and in the interval wrote to the *Times* a letter containing an offer to go out, and devote himself to a reformation of the kitchens at the seat of war. But before he discloses the result, he lays down a set of immortal maxims on the essential methods of serving kidneys, tripe, mirrored and curried eggs, and cold asparagus salad. Next morning, “scarcely had the first gleam of Aurora” peeped through his curtains, than some one came in to report that his letter was in the *Times*, that the world was up about it, and that he would certainly be sent on a gridiron mission to Constantinople. But he was determined to make no further sign until summoned by the powers, and he undertook an independent excursion to Windsor:—

“On my arrival at the station, I merely had time to take my ticket and run to the train, which was just on the move. In a few seconds we were flying over rows of houses like vampires, leaving the then desolate Royal property, Vauxhall tunable-down theatre, with its skeleton firework frame, on the left. We passed through Chiswick, Barnes, Mortlake, Kew, with its toyish pagoda, leaving to the left Richmond, with its picturesque banks, cheerful villas, heroine of the hill, and its exquisite maids of honour; at the same time crossing the Thames, cheerfully smiling beneath us in its serpentine bed. Its limpid currents flowed merrily downwards to the mighty ocean through green bushes, aquatic plants, and the alabaster-coloured plumage of hundreds of swans.”

—So conscientiously minute, so epically descriptive, is M. Soyer. Wrapped in delicious meditations he was interrupted by a deformed stableman, at whom he hurled (he says) these words, “Away with you, unsociable and ill-timed Quasimodo!” And well for M. Soyer that he hurried up to town. A mounted groom had been to his lodgings;—on his desk was a letter from the Duchess of Sutherland;—he was invited to an interview with her at Stafford House:—

“At ten minutes to two I entered the superb portico of Stafford House, and was shown to the ground-floor library by the Duke's piper, young Mackenzie. ‘Her Grace will be with you presently,’ said he. ‘Walk in, sir, and I will apprise the Duchess of your arrival; who, I am aware, is anxious to see you.’ I thanked him for his politeness, and he left me alone. I had scarcely time to cast a glance of admiration upon one of the *chefs-d'œuvre* of Landseer, representing the juvenile Stafford family, when her Grace entered, followed

by the Duke and Duchess of Argyle, the Marquis and Marchioness of Stafford, the Marquis of Kildare, Lord and Lady Blandy, her brother, and the children—about eighteen in number—Lady Grosvenor, and others. The Duchess of Sutherland introduced me to the noble circle, and requested all to be seated, which request was at once complied with.”

There was a grand consultation, and the Duke of Argyle left to lay the plan before a Cabinet Council! Henceforth M. Soyer was a centre of attraction; the portals of Stafford House were open to him; he was seen at the War Office, and by a score of important people; the Sutherland cooks experimented upon his receipts:—

“The order having been given, a footman entered with the samples on a plateau, with spoons, &c., which were tasted by the select and noble party, who at once pronounced them very palatable, and to which I remarked, that through the nature of the ingredients they could not fail to be nutritious and light.” * * * In fact, said I to the Marquis of Stafford, who had tasted several of the samples, ‘does not your lordship opine that salt and pepper should be almost excluded from the ward, and that the cook should be as responsible for seasoning the food as the apothecary is for making up the doctor's prescription correctly?’—“Certainly, but can you persuade them to do so?”—“Very easily; by my system of diet, every recipe will be printed, framed, and hung up in the kitchen, so that any person, even a soldier (provided he can read), will be capable of executing them well, as each receipt will be comprised in a few lines.”—“Ah! that will, indeed, be most valuable, and readily applied in every hospital.” During this conversation, the Duchess of Sutherland and the Marquis of Stafford had tasted another kind of food which I had made for the camp. It was prepared from peas-meal, in which I had introduced a due proportion of salt and pepper,—called ‘Symon's ground baked peas-meal,—and by pouring a pint of boiling water upon a good table-spoonful of it, made a most excellent and thick purée of peas quite hot.”

With such patronage, of course, the project flourished. It was a white day for the Scutari patients when the Duchess tasted M. Soyer's soup. A new stove was invented;—letters of introduction poured in;—amid the cheers of twenty friends the culinary magician took his start from London Bridge! “That night we slept at the Pavilion Hotel, Folkestone.” Two or three hours, and he was at Boulogne:—

“My intention was to take the first train, when on reaching the jetty, who should I perceive but my friend M. Léon, the Emperor's first valet-de-chambre, one of the persons that have been longest employed about his Majesty's person, having been with him above sixteen years. He is much esteemed by his Imperial master, none but himself approaching his person while in his private apartment. It is M. Léon who sleeps before the door of his illustrious master's chamber while travelling, as the Mamelouk Roustan did before that of Napoleon the First.”

M. Soyer is certain that, when he was at Boulogne, Louis Napoleon had packed his baggage for the Crimea; but news arrived of the Russian Emperor's death, and the Imperial intentions were diverted. So M. Soyer went on to Marseilles with his own suite, and made his observations in that city:—

“After viewing all the magazines of Marseilles and its warehouses, I perceived that my countrymen, in the way of national business, were very little boys, who could hardly walk, when compared with English commercial men and the houses of Crosse and Blackwell, Fortnum and Mason, Hogarth, Gamble, &c.

Mark the edible allusions prominent here and in every other page of the volume. At Marseilles he ate of the unique bouillabaisse (of which the receipt is given), and then proceeded

by steamer to Ajaccio. There he made the invariable pilgrimage to Bonaparte's birthplace. At that shrine his researches took an original turn: others might explore the drawing-rooms, library, and sleeping apartment; he asked for the key of the kitchen! No one had ever before made such a request, and La Signora Grossetti, puzzled and astonished, ransacked an old drawer in search of a key. The kitchen-door was opened, and fell from its hinges; the shutters were unfastened, and they, too, dropped to the floor. Upon the stove in this kitchen, "which first alighted the brain of that great hero," Alexis Soyer penned a record of his memorable visit:—

"On my left hand is a well-constructed charcoal stove, containing six nine-inch square cooking-places, covered with glazed red tiles (a piece of which I have procured, and intend placing in my kitchen at Scutari); an oval one, about eighteen inches long by about six inches wide, on which the most delicious fish, game, meat, and poultry, were no doubt submitted to the highest perfection of the culinary art. At the spot at which I am now writing, the roasting by wood fire, and the broiling by red ashes, were carried on, as I perceive, by the remains of the hearth. There is also the old jack, with the pulley that supported the rope and weights. On my right is an old semi-circular oven, partly in ruins, with an old-fashioned wrought-iron door, in which no doubt the cakes and choice pastry were prepared to gratify the Imperial infant's palate. Larders, confectionery, and all the requisite appointments of a kitchen are not wanting; which, though in a most dilapidated state, still left an appearance of grandeur which none but a family of distinction could afford—very different from what has been often reported and believed by the vulgar—viz., that this great man had his origin in the bosom of an indigent family."

To reward La Signora—aged eighty-three—he kissed her on both cheeks. We follow him swiftly to Scutari, where he arrived with his mind "as clear as a bell":—

"By this time the weather had assumed a most brilliant aspect—the morose and monotonous-looking clouds, which before monopolized the region in the immediate vicinity of the famed city of Mahomet, had been chased away by a strong breeze; the sun shed his golden rays in gorgeous streams from the purple vault of heaven, and the utmost depths of the lucid waters of the Bosphorus reflected his splendours."

He begins to look round for information:—

"Pray what are those rows of small domes, like well-corked bottles?"—"They are the kitchen chimneys."—"What, all of them?"—"Yes, sir; I have often been there, and know well enough that, although the Sultan no longer inhabits it, two or three hundred men-cooks remain in the kitchens."—"For what purpose, my friend, if no one lives there?"—"Oh, somebody does. I believe there is a college for some of the favourite sons of high Turkish families. Here," he continued, "look at this uneven row of houses with lattices. Do you know what they are?"—"No; pray what are they?"—"Why, Sultan Mahmoud's harem; and it is most probably still inhabited by a few of his old favourites and their suites, which are very numerous."—"Well, upon my word, those species of chalets put me very much in mind of chicken-cages." The English officer's wife, to whom I have before referred, and with whom I had some conversation during the passage, came upon deck while my dragoman was describing the surrounding scenery, and listened with vivid interest, taking notes of the most interesting passages. The dragoman, turning quickly round—"Madam," said he, "you see that colossal spout shooting out at a sharp incline towards the water. That is the spot from whence, if any of the Turkish ladies prove disobedient or faithless to their Imperial lord and master, they are stitched up in a sack alive, accompanied by a starving cat and a venomous serpent, and shot into that mighty watery grave, the Bosphorus."

Even a summons to dinner could not seduce the lyric fancy of our friend when he was gazing

upon "the vaporous edges of the humid clouds," which "seemed gilded with vermillion and silver tints," or on the "floods of light like living fire that fell upon the rich masses of the domes of various mosques, and hundreds of pointed and slender minarets." In the midst of the sweet reverie a vile interpreter broke upon the soft silence—"Il signor, la table d'autre est servi! et il se retrouft fortement! La soupe il étoit tout-à-fait démenagée de la tureen!" Base violation of a tragic dream! M. Soyer vindictively neglected the dinner, gazed at the panorama, saw a building which reminded him of the Reform Club, where he had "passed above two lustres of his culinary career," and retired to rest, "perfectly satisfied with having fed his mind." His wandering thoughts hovered all night in Oriental visions; but, on the following day, he entered upon his duties and carried on high negotiations with the British ambassador, his lady, and his cook. An inspection of the hospital kitchens proved how valuable his presence would be. Bad charcoal, green-wood smoke, burnt rice-pudding, unseasoned broth, and too much salt. Salt, though Homer calls it divine, is an ingredient of which M. Soyer would allow to hospital patients "little or none at all."

"We then crossed the yard to the general kitchen, as Miss Nightingale called it. Upon entering it, I found, to my surprise, a superb kitchen, built, I believe, by the Turks, and fitted up with twenty copper boilers, set in white marble, holding about fifty gallons each. About sixteen soldier cooks were employed cleaning the boilers, to make the tea, as the men's dinners had just been served."

In three marble ranges the soldier's food was effectively spoiled. The meat was skewered tightly along pieces of wood, and bound with cord:—

"The orderlies were now ordered not to tie their rations of meat so tight. Upon inspection I found that they had a most curious method of marking their different lots. Some used a piece of red cloth cut from an old jacket; others half-a-dozen old buttons tied together; old knives, forks, scissors, &c., but one in particular had hit upon an idea which could not fail to meet with our entire approval. The discovery of this brilliant idea was greeted with shouts of laughter from Miss Nightingale, the doctors, and myself. It consisted in tying a pair of old snuffers to the lot. All this rubbish was daily boiled with the meat, but probably required more cooking. On telling the man with the snuffers that it was a very dirty trick to put such things in the soup, the reply was—"How can it be dirty, sir? sure they have been boiling this last month."

A gentleman who co-operated with M. Soyer was Mr. Black, purveyor-in-chief, and husband of the Maid of Athens. Among M. Soyer's acquaintances, moreover, was the "Maid" herself, "now in her tenth lustre." But the calls of duty were stern, and Greek beauty did not win the French philanthropist from the marble ranges:—

"In a short time, and without much trouble, I initiated the soldier cooks into my method, and taught the sergeant to see it properly executed. I shall here describe the process fully, as it will be generally useful for hospitals or public institutions. In the first place I drew up two receipts—the one by weight and the other by measure, the former for beef and the latter for mutton soups. Mutton was the principal meat used for patients in a state of convalescence. These receipts I had carefully copied and hung up in the kitchen, at the same time supplying the cooks with weights and scales. I also taught them how to stew the meat well, and to manage the fires so as to prevent over-boiling or burning, as well as to economize the fuel. It was no longer a matter of much difficulty. Every soldier had become a cook; and if in case of any of them being removed to their regiments, one of the

initiated, under the direction of the above-mentioned sergeant, who was not changed, soon made a new recruit capable of cooking for any number. So simple was this plan, that it was as easy to cook for thousands as it had before been for hundreds, and to do it to perfection."

He improved the soldiers' teapots, economized their fuel, taught them to flavour their rations, and really astonished the generals. At the great hospital the modest narrator says:—

"The day after the opening, I proposed to Doctors Cumming and Macgregor, the superintendent, to take one wing of the hospital, which contained one-fourth of the patients, and supply these with all which they might require. This I did with the greatest ease, and without the least confusion, much to the satisfaction of the patients. I continued to do this for three days, and then took half of the hospital in hand. As I wished fully to impress the patients with the superiority of my newly-adopted diets, I then took the other half in hand, and put the first back to the old régime, for a day or two, as I was not quite prepared to undertake the whole at once. The patients immediately became dissatisfied, so I was obliged to go with Dr. Macgregor to them and explain the reason of the sudden change, which was only momentary, three cheers from my numerous guests closing my laconic, though effective, speech."

He had set Scutari "to rights," and was now bound for the Crimea. The poet's frenzy once more seizing his pen, he writes:—

"It was indeed a lovely day—the air was redolent with perfume and freshness; not a ripple seemed to ruffle the surface of the mighty Bosphorus, whose ever-foaming current appeared to have buried itself deep in the bed of that turbulent stream. A few caiques were seen here and there swiftly gliding over its calm surface, occasionally disturbed by the dipping of the sea-gulls. The Bosphorus gulls have a peculiar chalky colour, differing from that of the ocean bird, which circumstance, no doubt, caused Lord Byron, in his beautiful poem, to call them the ghosts of the Houris, launched to eternity in the depths of that solemn flood of romance, poetical love, and tragic reminiscence. While skimming its surface they darted now and then, with the rapidity of lightning, down upon a rash little denizen of the deep who had ventured too near the surface of the limpid element to bask in the warmth of the generous rays of that friend of the whole world, the sun. All was peace, love, and repose. A vaporous golden tint seemed to envelope the world-famed city of Constantinople—it its mosques, forests of minarets, Golden Horn, and European and Asiatic shores, with the Oriental atmosphere so peculiar to the Bosphorus. Nature seemed to be in its most sublime humour; heaven, earth, and ocean had that day agreed to be in love with humanity."

If M. Soyer could only have cooked a gull! Charming colloquies with Miss Nightingale tinted with ideality the Black Sea voyage; and in return for much affable courtesy, he paints her portrait in such language as Hatim Tai might employ to describe some beneficent queen who had released him from a danger of death. His other companions he sketches with equal freedom, not excepting a gentleman named Peter Morrison, who, undoubtedly, has reason to complain of M. Soyer's frank facility of reminiscence. For himself, M. Soyer went actually within range of the Sebastopol batteries:

"At all events, we arrived in the Three-mortar Battery without accident. It contained three large mortars, and instead of being two hundred yards, as Mr. Anderson had called the distance, was full half a mile from the Flagstaff, going towards Sebastopol, and quite exposed to fire, had they thought it worth while to play upon us. We had, however, an excellent view of the besieged city, such as very few amateurs can boast of having obtained. Before leaving the battery, I begged Miss Nightingale, as a favour, to give me her hand, which she did. I then requested her to ascend the stone rampart next the wooden gun carriage, and lastly, to sit upon the centre mortar, to which

requests she very gracefully and kindly acceded. I then boldly exclaimed, 'Gentlemen, behold this amiable lady sitting fearlessly upon that terrible instrument of war ! behold the heroic daughter of England—the soldier's friend !' All present shouted, 'Bravo ! bravo ! hurrah ! hurrah !' Long live the daughter of England !' As the cannonade increased instead of diminishing, this gave a kind of martial note of approval to our solemn and enthusiastic ceremony. We then left the spot, again to risk our noble selves, as I observed to our friend P.M."

Lord Raglan, Admiral Boxer, and Omer Pasha, were among the new accessions to his circle of distinguished friends,—he was an honoured and a happy man. "All was joy, heroism, and a thirst for glory," and the cookery of the camp perceptibly improved. In fact, it was from M. Soyer that the British grenadier got his stomach for fighting. No more tasteless starvation rations, but sound food flavoured by art and combined by science. Clever at these delectable machinations our reformer swells with pardonable self-love, and is pleased to introduce an example of his own wit:—

"One afternoon, at a French restaurant in the Haymarket, a rather animated discussion, *à propos* of the new republic of the '48, took place between myself and a person whom I afterwards ascertained to be the duellist Cournet, an officer in the French navy, who has already been mentioned in the earlier pages of this work. My entire disapproval of the conduct of the friends of liberty, as shown by their wanton destruction of everything, both useful and ornamental, even to the court breeches and white inexpressibles of the National Guard (which were exposed to dry at every window of the Palace of the Tuilleries, thus giving to that noble building somewhat the appearance of that Rag Fair), was so strongly expressed, that Cournet, 'taking umbrage therat,' after calling me a monarchist and an enemy to liberty, insisted upon my meeting him the next morning, to give him the satisfaction due from one gentleman to another. I replied to his challenge by desiring that the matter should be settled at once. He answered, in a haughty tone, 'Comme vous voudrez, monsieur. C'est à vous le choix des armes. Nous tirerons ce que vous voudrez !'—'Eh bien,' said I, 'puisque c'est à moi le choix des armes, sortons à l'instant même, monsieur, et nous allons nous tirer les cheveux.'—'As you please, sir. The choice of weapons is yours.'—In that case, I suppose we must pull triggers for it.'—'Sir,' replied he, 'we will pull any mortal thing you please.'—'Good,' said I; 'then we will at once proceed to pull each other's hair.'"

Rather a sorry digression this, M. Soyer. Your colloquy with Omer Pasha is better:—

"Monsieur Soyer," said Omer Pasha, "what have you good to eat there ?"—"Nothing at present, your Excellency; but by-and-by, when my plans are adopted, we shall be able to cook for and feed the army with ease."—"Ah, this is a matter of great importance. Pray explain your plans to me." When I had done this, Omer Pasha said, "It will first be necessary to have something to cook." The truth of the observation I respectfully admitted, with a low bow, adding, "Your Excellency is right; but as the probability is that something to be cooked never yet entirely failed, and in expectation of better times coming, we confidently hope that the provisions for the army will shortly be on the increase instead of the decrease. This hope has induced me to invent this apparatus, of which, when its principle has been fully explained, I have no doubt you will, with Lord Raglan, approve."—"Monsieur Soyer, I have no doubt that, as regards cooking, you are a very clever man; but if you could manage to cook a dinner out of nothing, you would be more clever still."—"Not having tried the experiment, I really cannot say whether I could do so or not; but I will try, and then report progress to your Excellency."

But the purest specimen of garrulity is this:—"Monsieur Soyer" (Lord Raglan, as he said this, was standing in the doorway, leaning on his right shoulder, with his legs crossed, and surround-

ed by several gentlemen, forming a group which I shall not forget as long as I live,) "you must have known my old friend Ude ?"—"I did, my lord."—"How many years were you at the Reform Club ?"—"Above twelve. It was old Mr. Ude who gave the late Madame Soyer away when we were married; so we often visited him."—Lord Alvanley, who had apartments at Mr. Ude's, lived there for years, and I frequently visited him," said Lord Raglan.—"If so, no doubt your lordship will recollect a very interesting picture of a country girl going to market, with a basket of poultry under her arm ?"—"I do, very well indeed, and I know it was painted by your wife. It was very cleverly done. But you had all her best pictures at the Reform Club. You showed them to me yourself."—"I recollect doing so perfectly well."—"She was a very talented woman indeed !" observed several of the gentlemen present, who had seen her pictures.—"She was an Englishwoman, was she not, Monsieur Soyer ?" said his lordship.—"Yes, my lord; her maiden name was Emma Jones."—Of course, rejoined one of the group, "her paintings were well known by that name."—"So they were, captain, and fetched high prices, too. I do not sell any now; on the contrary, I still have my gallery complete, and have bought in several since her death. I offered old Ude fifty guineas for the painting in his possession called 'La Jeune Fermière'; but he would not part with it, as it was presented to him by her. Previous to my departure from England for the East, I was advised by the chaplain of the cemetery to insert on the monument the country of her birth, as many believed her to be a foreigner. The inscription was simply 'To Her.' I then composed the following laconic epitaph:—'To the Memory of Madame Soyer.—England gave her birth. Genius immortality.'—'Very good, indeed,' said his lordship. 'I myself have seen the monument, which is considered one of the finest in Kensal Green Cemetery.'

There is an anecdote of Ude's family life, too long for quotation, but characteristic. M. Soyer himself, in proof of his own modesty, adopted the title of Capt. Cook, dressed himself in a style that would have satisfied Queen Marmite—white burnous, trousers with blue and silver stripes, a red and white cap, and a gold-braided waistcoat, and with his twelve attendants was mistaken for Marshal Pelissier, "attended by a brilliant staff of generals." How he in reality prepared a feast for thirty-four generals,—how Russians, French, English, and Sardinians flattered him,—how Lüders having eaten of his Macedoine proposed an English toast,—and how the King of Kettles improvised a lunch for a Russian general, we must leave for the curious reader to learn. We make another extract—it must be the last—to exhibit M. Soyer's conference with the sublime Sultan:

"Crossing a floral carpet of sweet perfume, interwoven with plots of choice exotic plants and flowers, marble fountains, vases, baths, &c., we ascended a staircase, and were introduced to a simply, but costly-furnished apartment, when Mr. Pizanni remarked that we had already made a near approach to the person of his Majesty. Hardly had he uttered the remark, when a eunuch entered, and requested us to follow him. We passed through several long dark corridors, richly tapestried, and here and there interposed with coloured glass, which threw a golden-yellow light, reflecting a peculiar hue on the eunuchs who were here and there stationed, keeping guard. Silence reigned supreme. We soon reached a very spacious area. A screen was suddenly removed, when, standing on the summit of a grand crystal staircase, most brilliantly illuminated with resplendent vermillion glass shades, stood erect a figure, which, at first sight, I took for an idol or statue belonging to this enchanting place. Mr. Pizanni advanced, with great veneration, towards it, bidding me follow, over highly-polished glassy-looking floor, which I did not without fear of slipping—when, to my astonishment, I found myself standing before Abdul Medjid Khan, the Padischah, who, though simply attired in a rich robe de chambre and a

plain fez,—which I believe is the oriental dress of reception,—the sublimity of the monarch's countenance will never be effaced from my memory. Mr. Pizanni, addressing his Majesty in the Turkish language, introduced me, when, through that gentleman, I ascertained that his Majesty wished me well, and that his heart was well disposed towards me (meaning a great deal in a few words). His Majesty was then informed of the purport of my mission, commencing at the hospitals of the Bosphorus, then in the Crimea. His approbation was expressed by the slow movement of the head from left to right, the body remaining motionless. Then took place the offering of my various productions, culinary and literary, eight in number, which lay on a large, richly-ornamented piece of furniture, in the centre of this large cupola. The simplicity of the field-stove obtained his Majesty's high approbation. 'I well understand them,' said he, talking all the time to Mr. Pizanni, who translated word for word to me. After having complimented me very highly on the services of my undertaking, 'I am much pleased,' were the last words his Majesty uttered. We then retreated backwards. Though the conversation had been varied and animated, not a movement on the part of his Majesty did I perceive all the twenty minutes we were conversing. We left the idol as we found it."

The book is all gossip, and in great part nonsense; but it overflows with good humour, light anecdotes, and fascinating suggestions of things to make glad the heart of man.

China, Australia, and the Pacific Islands, in the Years 1855-56. By J. D'Ewes, Esq. (Bentley.)

Mr. D'Ewes sailed from England in the ship *Vibia*, hoisting the Latin Grammar at his main. We doubt, however, his right to such a flag. In which Latin Grammar did Mr. D'Ewes find the motto figuring on his title-page—"Super et Garamantos et Indos" ? How would he scan it ? We recommend him to consult his Virgil. A few pages from the title, Mr. D'Ewes tells us he "has a great objection to the profanum vulgas." Might not the profane vulgar, who do sometimes cruelly maltreat their mother-tongue, ask Mr. D'Ewes what he means by his *Ficus Indicus* ?

Mr. D'Ewes, as appears from his more intelligible English text, left England in the latter end of 1852, when, "owing to a lengthened course of London and Parisian life, his physical and financial thermometer was fast approaching to zero," and sailed for the El Dorado of Ballarat. The Gold Fever was there at its height; and, if Fortune had wished to give him a turn of the wheel, he might have stumbled on a monster nugget or risen up a millionaire out of one of those "dirty and abominable holes" misnamed inns—the ins and outs of which he thus describes:—

"Drunken diggers were lying about the verandah and unwashed floors of the building in every stage of intoxication, and we were absolutely obliged to step over their prostrate forms in order to approach a table to get some refreshment. This place being half-way from Ballarat to Geelong, was of course the great halting-place for travellers, and it was not an uncommon practice for the successful digger upon his arrival, after a long and weary march from the diggings, to throw a small bag of gold-dust, perhaps containing several ounces, to the landlord, and tell him that he intended to drink it out, and not leave until it was finished; a consummation very soon effected by that worthy, who speedily aroused his reckless customer from a senseless fit of intoxication, with the information that the proceeds of his gold were all melted into alcohol."

But there were no ounces of gold in store for Mr. D'Ewes. True he succeeded in gaining the chair of magistrate, no sinecure we may believe among the diggers, but this sunshine

lasted not long. We have heard before of the riots which took place about the licences at the Diggings, and of the Bentley and Scobie case. The diggers murmured, held meetings, and finally stockaded themselves, and shot some of the police and a few soldiers and Capt. Wise of the 40th. The Governor, Sir C. Hotham, disapproved of the part played by the magistrates; and in the issue Mr. D'Ewes found himself once more a wanderer and on his way for Sydney. Thence he moved to the Friendly Islands, and so through many a picturesque group of islets "where only man is vile." Some of the intelligence he collected in this cruise is, we hope, "more surprising than accurate":—

"In the course of a conversation with Capt. Wells and his first mate, Mr. Sherman, of the American whaling vessel, 'Logan,' lost on a reef near the Fejee Islands, and whom we had taken on board with us at Tonga, to convey them to the Navigator Islands,—we were informed that, during the three weeks they passed on the Fejee Islands before they could find a vessel to take them away, they witnessed and heard the most dreadful characters and practices of some white men, who resided on the Island of Ovalou, and at the town of Levoca, about thirty-five in number, chiefly English and American, some Manila Spaniards, and about fifty half-caste. It appeared from the confession, or rather boast, of several of them to this officer whilst residing with his crew at the island,—and where there is also an individual who calls himself an American consul, but who could render him no assistance whatever,—that crimes of the most dreadful nature were of continual occurrence amongst them, uncontrolled as they are by any law, human or divine, and the missionary resident on the spot is in too great fear of them to report the matter to the proper quarter. Capt. Wells states that some of their number have been known to join the natives in their cannibal feasts, and that each possesses a plurality of wives, or rather slaves, upon whom, on the slightest occasion (particularly complaining to the missionary) they inflict the most horrible tortures. One instance he mentioned of a woman being roasted alive by a slow fire, and that they were often placed in irons, until the fetters had worn into the wrists and ankles. Murders were common amongst them; and when they could procure drink, they were more like demons than human beings."

From New Zealand our author sailed to the Yang-Tze-Keeang, made a short expedition to the famous city of Sou-cheou-fou, the Capua of China, and thence returned by Java to England.

In this world-wide tour Mr. D'Ewes does not add very largely to our stock of knowledge; but he writes agreeably, and his book will amuse those who have leisure in these stirring times to be amused after a quiet dreamy fashion.

Indigenous Races of the Earth; or, New Chapters of Ethnological Inquiry. By J. C. Nott, M.D., and G. R. Gliddon. (Tribune & Co.)

It is said that when Sir Humphry Davy first showed the metal potassium, which is lighter than water, to Dr. Wollaston, asking him what he thought of its nature, he replied, "It must be a metal, it is so heavy." Its brilliancy and other characters rendered it probable that the substance was a metal, and this idea immediately suggested its being heavy. The balance soon corrected the Doctor's error. But if it be necessary for the natural philosopher to bring the suggestions of his mind to the test of his instruments, how much more necessary is it for the philosopher dealing with facts affecting the social and political relations of man to be on his guard against the suggestions which arise unconsciously from the education which he has received, and influence

his judgment in the construction of scientific theories. So liable are men thus to be led away, that we do not look for scientific investigation or a spirit of truthfulness amongst those whose interests are dependent upon the maintenance of a particular view of the question to be investigated. We do not expect to arrive at the truth about the men of the Commonwealth from the literature of the Restoration. The principles of Free Trade were not worked out in this country by the large landowners. We do not look to London bakers to furnish us with an accurate analysis of bread. We hope we may be forgiven if we say that it was with a feeling of this kind that we opened the work on 'The Indigenous Races of the Earth' from America. We had had a little experience of how our American friends treat ethnological questions in 'The Types of Mankind,' and when a work of the same portentous size, with the same ugly heads of "inferior races," the same list of subscribers, and the same editors, made its appearance, we feared that the cause of Ethnological science could not gain much thereby.

As Pritchard left the science, all the great facts of ethnology led to the conclusion that man had a single origin, and that wherever found he belonged to the same species. Such are also the conclusions of Dr. Latham, who, if we cannot regard him on all points as so competent an ethnologist as Pritchard, as a philologist with many other requisites for the study of ethnology, has even greater claims to be heard. These two points the American sciolists call in question. Taking advantage of doubts that troubled the later days of Morton, who, though great as an anatomist, was confessedly deficient in other sciences required for the accomplished ethnologist, they have boldly gone forward to do battle for the multiplicity of origins of the human race, and consequently a multiplicity of species. The moving spirits of this controversy are Messrs. Nott and Gliddon, and they have surrounded themselves with such men as Agassiz, Leidy, Pulszky, Maury, Meigs, Usher, and Patterson. We mention these names because they are indications of the worth of their contributions to ethnology. In the present volume Agassiz contributes nothing more than a letter, to say that he believes in the truth of his former theory, that human beings have had eight different origins. He finds this theory on the fact, that he finds man surrounded by eight different groups of animals in different parts of the globe, and as they must have had different origins so he concludes man had. But in this statement he does not deal with the fact, that none of the animals in the eight different groups will produce with each other fertile offspring, whilst this we know to be the case with man, and is one of the many arguments in favour of his common origin.

Nor is Prof. Agassiz less happy with the philological argument. It is stated that the identity of sounds expressing ideas, as of number, throughout so large portions of the human race, clearly indicates a common origin. "Let any one follow," he says, "upon a map exhibiting the geographical distribution of the bears, the cats, the hollow-horned ruminants, the gallinaceous birds, the ducks, or of any other families, and he may trace as satisfactorily as any philological evidence can prove it for the human language, and upon a much larger scale, that the brumming of the bears of Kamtschatka is akin to that of the bears of Thibet, of the East Indies, of the Sunda Islands, of Nepal, of Syria, of Europe, of Siberia, of the United States, of the Rocky Mountains, and of the Andes; though all these bears are considered as distinct species, who have not any more in-

herited their voice one from the other than the races of men."

In this argument Prof. Agassiz loses sight of the fact, that the identity of human language does not depend on voice, but on certain arbitrary sounds of the voice. If all bears invariably uttered the same growl when they saw the same thing it would be one argument in favour of their belonging to the same species.

Other contributors to this volume are the editors, Dr. Nott and Mr. Gliddon. The first of these gentlemen is a Doctor of Medicine, and contributes a paper 'On Acclimation, or the Comparative Influences of Climate, Epidemic and Epidemic Diseases, on the Races of Men.' The object of this paper is to confirm "the conclusion that certain distinct types of the human family are as ancient and as permanent as the Faunas and Floras which surround them." We do not deny that Dr. Nott has collected in this paper a great deal of valuable information, and we commend it to the attention of our medical readers; but we deny that the facts brought forward lead necessarily to all the conclusions at which Dr. Nott has arrived. Thus, speaking of the white races of Europe, the Mongols of Asia, the blacks of Africa, and the aborigines of America, he says:

"That the types of man belonging to these realms antedate all human records by thousands of years, and are as ancient as the Faunas, of which each forms an original element. That the types of man are separated by specific characters, as well marked and as permanent as those which designate the species of other genera."

Mr. Gliddon, the other editor, was formerly the United States Consul at Cairo, and has interested himself in the remains of the nations of antiquity found in that part of the world. He was the author of the clever, but superficial, 'Archæological Introduction to the 10th Chapter of Genesis,' in 'The Types of Mankind,' and probably regards himself as an ethnologist from the philological point of view. He is the author of the larger part of the present volume, and contributes a huge essay, with the title 'The Monogenists and the Polygenists; being an Exposition of Schools professing to sustain dogmatically the Unity or the Diversity of Human Races, with an Inquiry into the Antiquity of Mankind upon Earth, viewed Chronologically, Historically, and Paleontologically.' We need not say that, on all the questions discussed, Mr. Gliddon is opposed to received opinions; and we do not mean here the received opinions of the masses, or those incompetent to form correct judgments, but of those of scholars and philosophers. Mr. Gliddon is a polygenist, and holds with the doctrine of a multiplicity of human pairs—the almost necessary corollary, that the pairs were created at different times—and, also, that some of them were created at periods immeasurably distant from any our own chronology contemplates. In supporting these views, Mr. Gliddon does not enter upon the subject as a philosopher, but as a controversialist. He assumes that all who hold opposite views are influenced by priesthood and a superstitious belief in the truth of the statements of the Bible. He introduces his remarks by a quotation from Humboldt's 'Cosmos,' bracketed with his own interpretations of Humboldt's real meaning, and accuses Mrs. Sabine and Miss Otté of tampering with the text,—the one to preserve her husband's position as Secretary of the orthodox Royal Society, and the other to secure the "gratitude and applause of wondering theologers." But our readers will be glad to know that there is hope for England yet. "Into parliament, stilled England even," he says, "the light is beginning to penetrate." But what

if we could show Mr. Gliddon that such light as he talks of shone long ago, and that Englishmen have ceased to believe in it because it was no true light! We think we could show Mr. Gliddon that the views he holds were all held by a young surgeon in London, before he was born, and who gave up these views, not through the fear of priests and Members of Parliament, but simply because he regarded them as untenable. The English reader has much more reason for turning round upon Mr. Gliddon and accusing him of complicity with the slave-holders of America, everywhere seeking to make out a case for the maintenance of the Negro race in slavery on account of their different origin and inferior nature. Mr. Gliddon confesses that, although his father, who was United States Consul at Cairo, manumitted his slaves in 1826, for "conscience' sake," he never participated in such sentiments; and, regardless of "Exeter Hall," thinks it preferable that the purchase and sale of slaves should go on. With such opinions we are not surprised to find him pursuing his polygenist arguments, without caring much for the evidence on the other side. In the question of the derivation of the human race from many pairs or a single pair, Mr. Gliddon entirely overlooks the aid to be derived from the palaeontological argument. The late Prof. Edward Forbes, in a series of admirable papers, showed, that of the two hypotheses, of a single or a number of origins for each species, the former alone could be adopted by the palaeontologist. He showed that if there had been more than one origin for each animal in space, then such origin might have occurred at a different time, and thus animal remains could not be regarded as indicative of the age of rocks. Thus, supposing any one of the forms of Trilobites to have had twenty different origins at different times, how could it be regarded as characteristic of the Silurian period? He showed, moreover, that the only theory which would account for the distribution of animals and plants on the surface of the earth was the hypothesis of the original creation of a single pair, or an individual, as the case might be, from which all others had radiated, as from a common centre. These arguments, which, however far distant from proof, ought to be taken into any consideration of this question, are not even alluded to by Mr. Gliddon.

The conclusion of Mr. Gliddon's essay is devoted to the consideration of the "geographical distribution of the Simiae in relation to that of some of the inferior types of man." The object of this part of the essay is to show, first, that it is highly improbable that all the monkeys in the world were descended from the pair that landed with Noah out of the ark on Mount Ararat; and, secondly, that as the monkeys are an order and man is an order, it is just as probable that there are species of man, as there are species of monkey. With regard to the first point, we think that Mr. Gliddon has proved his case, and would only remind him that an eminent English theologian, Pye Smith, did the same twenty-five years ago. With regard to the last point, we may give Mr. Gliddon all the advantage of the difficulty of defining and applying the word "species," but still maintain that, whilst the evidence of all kinds is very conclusive as to the diverse origins and various species of monkey, that same kind of evidence, though perhaps not so decisively, points to the origin of the human race from a single pair.

The work contains three other essays to which we may draw attention. The first is by M. Alfred Maury, Librarian of the French Imperial Institute, and Secretary of the Geographical Society of Paris, "On the Distribution

and Classification of Tongues." This is a large subject treated in a small space; and if we pronounce it superficial, it is only what could be expected. The next essay is by the late Under-Secretary of State in Hungary, Francis Pulszky. It is entitled "Iconographic Researches on Human Races and their Art." The object of the essay is to prove the diversity of the human race from the constancy of national Art, more especially amongst the nations of antiquity. This gives Mr. Pulszky an opportunity of displaying his knowledge of ancient Art, but it really proves nothing with regard to the argument of the book. As well might we bring forward the difference in habit, belief, or work of Art between the inhabitants of the north and south of England, to prove their independent origin, as such researches as those of Mr. Pulszky to determine the ethnological question raised in this book.

The last contributor to this volume is Dr. I. Aitken Meigs, Professor of the Institute of Medicine in Philadelphia. He devotes himself to the anatomical question, and writes a paper "On the Cranial Characteristics of the Races of Men." The author believes that there are certain permanent characteristics in the skull of the various types of man; but he says, with a modesty not characteristic of some other parts of the book, "That in the present state of our knowledge, however, we are by no means certain that such types were primitively distinct." We ask no more of Mr. Gliddon and his companions. We do not contend for the unity of the origin of the human race as an ascertained fact. We ask them in all fairness that they should judge according to the evidence, and be able to give a reason for their belief; that they should not call names and take sides, but that they should approach the great and interesting questions which they have discussed with the earnestness and sincerity which become men in search of truth.

A Polyglot of Foreign Proverbs; comprising French, Italian, German, Dutch, Spanish, Portuguese, and Danish, with English Translations, and a General Index. By Henry G. Bohn. (Bohn.)

THERE have been many definitions of the word Proverb. We will not attempt a new one. It is generally imagined that the first proverb-makers were oracular gentlemen who, whether they thought little or much, enunciated their wisdom in minute but pungent doses. We are inclined to believe that it is to the long and painstaking writers that we owe the "proverb." Their happiest phrases, bubbling over with rich intelligence, have usually been dragged from amid heavier matter, taken, like the pearl from the oyster. The writings of poets, philosophers, and novelists, abound with phrases which a slight manipulation has made to pass into wise saws for every-day quotation. It would be easy to pile up a mountain of proof on this matter; but it will suffice to trust to our memory for a few instances. Marlowe says, in his "Jew of Malta,"—

— Things past recovery
Are hardly cur'd by exclamation.

This is only one form of the "What can't be cured must be endured," and Marlowe may not have been the father of the proverb. His writings, nevertheless, abound with proverbial sayings, the echoes of which may be found in the pages before us. He says, in his "Hero and Leander," "Lone women, like empty houses, perish," and the Germans have a similar saying, as have also the Danish and the Dutch.

In the same poem, the phrase—

Vows are but seeds,
And good deeds, fruits,

might be put into prose and registered in any book of proverbs without questioning. We may say the same of "Trifling attempts no serious acts advance," which has a proverbial counterpart in every language. It is possible that when Leonardo da Vinci wrote the line "Chi non può quel che vuol, quel che può voglia," he had no thought of making a proverb which would go current over the world,—but which is not to be found in Mr. Bohn's Italian collection. In like way, many of Halifax's most felicitous maxims have passed into popular proverbs. Columella, in his "Non oportet villicum, plus sapere quam dominum," gave rise to the old saying, that the hints of masters have more wisdom than the ideas of servants. Even old preachers have, no doubt, helped in the same way. What can be more like a proverb than the fine line in one of Farindon's sermons, of the time of Charles the First, to the effect, that "A proud humility is pride in a chain"? Indeed, this line alone is worth many a proverb which might be spared from these pages, and which in their poor pretence are, as Churchill says,—

—happily serene,
Mean nothing, yet would seem to mean.

It is not to be denied that, occasionally, a poet may have taken a popular saw, and used the proverb for a poetical illustration. The proverb touching women and ships, for instance, was certainly well known, in various forms, before Randolph wrote—

Women and ships are never known
So fair, as when their sails are blown.

The editor would probably justify himself for the omission of the popular proverb in most languages, like the above, on the ground that it can be traced to an individual author, and is not general property; but then what becomes of "Raad voor daad," ("Council before action,") which is a phrase that belongs to Sallust, or "Frisch gewagt ist halb gewonnen," ("Boldly ventured is half-won,") which is the property of Horace, who states such a commencement as being "dimidium facti," and which is altered by Corneille into "Qui commence bien ne fait rien s'il n'achève." These instances illustrate what we have already suggested,—that to the writers we owe the speakers. In some of these writers we find opportunities of which the proverb collectors and utters have not always availed themselves. The old saying, that "It is not the cowl that makes the monk," is a good and a true saying; but there is a still better illustration in the second of the following lines, from Brooke's "Jack Giant-Queller":—

However some in coaches, in barrows some may beg,
'Tis want that makes the mendicant, and not the wooden leg.

In a nobler, but not apter style, Pope furnishes ample means for enlarging the list of proverbs, by sending fresh saws into the market.

Charms strike the sight, but merit wins the soul,
is a grandly-improved form of "Handsome is as handsome does," Hayley's line,

Silence that wins where Eloquence is vain,

is better worth circulating than the Dutch "Zwigen antwoordt veel" ("Silence answers much"). These last, however, are examples where writers have poetized the proverb. In earlier examples, it is more probable that the writer has coined and stamped it for circulation. The writings of that gay yet gloomy proconsul, Petronius Arbiter, contain many such instances, but the reader cannot always be certain whether Nero's celebrated official is original or a copyist. In either case, his pages abound in capital proverbial sayings, or sentences deserving to circulate as such. Here are cases in point:— "Quod hodie non est cras erit, sic vita traditur";—is not this far finer than "Zeit bringt alles, wer warten kann" ("Time brings everything to those who can wait

for it") of the Germans? And again, "Nequam recte faciet qui cito credit," although it be inferior, and inferior only to the terse, satirical, striking, and irresistible maxim of Lord Halifax, that "Men must be saved in this world by their want of faith," is superior to the Italian proverb, "Fidati era un buon uomo: Nontifidare era meglio," or, "Trust was a good man: Trustnot was a better."

Our comedy writers are, perhaps, more rich in phrases likely to pass into proverbial sayings than any other class of writers; and among them, probably, none is so rich as, certainly none richer than, Douglas Jerrold. Many of the epigrammatic lines of his lively dramas will become so familiar as to take their rank among the commonly quoted saws. What can be better in this respect, for certain and varied species of illustration, than the following from the "Bubbles of a Day"?—"Some memories, like wormwood, only flourish upon bitterness"; or, "A man may be very fond of grapes who shall not abide the fruit when it is dried into raisins"; and again, "Character is like money, when you've a great deal to spare you may risk some, for though you lose it folks still believe you have plenty to spare." Here, too, is a terse proverb, in which an old idea is better put than of old, "Friends are like money, it is only our wants that rouse their sleeping value." The last proverb is from the "Catspaw," in which comedy occurs a line so full of poetic and pathetic beauty, that it should henceforth be proverbially applied to our churchyard-flower for ever, namely, "The daisy is Death's forgotten!"

In returning to Mr. Bohn's collection, we will cheerfully render him the justice to state that, despite a few shortcomings, he has, with efficient aid, compiled a very amusing, and often a very suggestive, volume. There is one thing that the student will be struck with, the universal want of gallantry manifested in the proverbs of all languages towards the female sex,— "Woman's beauty, the forest echo, and the rainbow soon pass away," say the ungallant Germans; who further uncivilly attest that, "Women and maidens must be praised whether truly or falsely," that "Women are never at a loss for words," that "Women are as fickle as April weather," that "Women, fortune, and gold favour fools," that "Watching women is labour in vain," that "Women are watches that keep bad time," and that "A woman's vengeance knows no bounds." The Italians are not so downright damnable as this; but their hints are almost as strong as the Teutonic assertions. "Women's tears are a fountain of craft," and "Women always speak the truth—but not the whole truth," say the Southern moralists, adding that "Women and hens are lost by too much gadding," "Women know a point more than the devil," that "Women rouge that they may not blush," and that "Women, priests, and poultry, never have enough!" Then come the slandering Portuguese grinders of maxims, which they deliver according to this bad measure:—"Your wife and sheep early at home," and "Women and glass are always in danger." The haughty Spaniard states that "Women, wind, and fortune soon change." Jerrold, on the other hand, rather compliments the sex when he lays down his maxim, in "St. Cupid," that "To fan treason into a full blaze always fan with a petticoat." The testy foreign proverb-makers do not allow merit in any class of dames. One sneers at the tears of the bride as a pretence, and her modesty as a hypocrisy; another says, "The mother-in-law does not remember that she was once a daughter-in-law," and the general unpleasantness of the first-mentioned individual

is further insisted on in the Spanish proverb which says that, "The mother must be entreated and the pot be let stand."

The German proverb, "A baptized Jew is a circumcised Christian," reminds us of Cobbett's stereotyped saying that "An English Quaker was only an uncircumcised Jew." "A borrowed horse and your own spurs make short miles," is a Danish rendering of a rather universal practice. "A courtier should be without feeling and without honour," is an old-world French sentiment, which has been adopted, like old French fashions, in Russia. "A doctor and a boor know more than a doctor alone," is not complimentary to the medical profession, but it is the German idea. "A fine girl and a tattered gown always find something to hook them," is the French idea of beauty in distress. The Spanish proverbs have many hard hits at the Church, and here is one of them—"Abbot of Carquela, you eat up the pot and ask for the pipkin." The Dutch thief seemed to have a lax morality when he said, "Bad company, as he went to the gallows between the monk and the hangman!"

"Choose neither a woman nor linen by candle-light," is another Spanish fling at the sex; and "Do not talk Arabic in the house of a Moor," is a Spanish memory of the necessity of caution in olden times, when Moorish works and Spanish faith would have made a good Christian. The following explain themselves:—"Everybody must wear out one pair of fool's shoes, if he wear no more."—"For love of the ox the wolf licks the yoke."—"Greater fools than they of Zago, who dunged the steeple to make it grow."—"He is as good a Catholic as Duke Alva's dog, who ate flesh in Lent."—"I am a judge of cresses," said the peasant, as he was eating hemlock."—"Judges should have two ears, both alike."—"Know, cabbages, that there is spinach in the stew."—"Lawyers' robes are lined with the obstinacy of suitors."—"Many a cow stands in the meadow and looks wistfully at the common."—"Now that I have an ewe and a lamb everybody says to me, 'Good morrow, Peter!'"—"One candle for St. Michael and another for the Devil."—"Peter, I am taking a ride," said the goose when the fox was running into the wood with her."—"Rent and taxes never sleep."—"Safe over the bridge, one laughs at St. Nepomuck," a proverb which should have had a note appended to explain that the saint in question is the peculiar guardian of bridges. The French proverb, "The dead are soon forgotten," is a truism rather than a proverb, and is very poor when compared with the passage in the "Hydriotaphia" of Sir Thomas Browne,—"Our fathers find their graves in our short memories, and sadly tell us how we may be buried in our survivors." There is more than one proverb alluding to the fact that he who lies alone is cold, and that companionship keepeth warm,—which may have been in the mind of Aristotle when, after fixing the best ages for espousing, as eighteen with thirty-seven, adds a recommendation to people always to marry in winter, when the wind is in the north-east. "Unbending the bow does not heal the wound," conveys an undeniable truth; and there is no bad illustration in the proverb, "Virtue in the middle," said the Devil when seated between two lawyers"; nor in "What the Abbot of Bamba cannot eat he gives away for the good of his soul"; and, finally, the Galicians have an excellent satire on their own pride, in the saying, "You a lady, I a lady, who is to put the sow out of doors?"

We conclude by commanding the editor and his assistants for their industry. We must add, that the German proverbs might have received some excellent additions from Zschokke, and

that some rare old Italian treasures of the same sort are to be raked together out of the "Astuzie di Bertoldo,"—a book recording the sayings and doings of the jester at the court of Alboin, king of the Lombards.

The Recurring Monthly Periods and Periodic System of the Atmospheric Actions. By W. H. B. Webster. (Simpkin, Marshall & Co.)

THE author is a surgeon in the navy, who has devoted much attention to meteorology, collecting his data from all quarters. He imagines himself to have detected a strong and almost uniform tendency to certain recurrences. We wish we could quote any one passage which should set forth the alleged phenomena intelligibly: but we cannot. There are examples in the first chapter, and descriptions in the last, separated by all kinds of unconnected matter. We must do our best to state the matter in our own way, and it is the author's own fault if we do not do it to his satisfaction. We never met with a writer who set scissors so completely at defiance.

Mr. Webster believes himself to have discovered that the weather is constantly marked by *recurrences*, separated by a solar month of 30½ days. Accordingly, to him the same days of the month, or *nearly* the same days, are *critical*, either show the highest or lowest barometer of the month, or else the highest or lowest thermometer. This he affirms he has verified in an enormous number of instances, of which he gives a few. Of course we neither admit nor deny this discovery: our business is only to describe it. We shall show our readers what he gives us, from Mr. Howard's observations, for the year Sept. 1819 to Sept. 1820. It appears that 1819, Sept. 20 was the highest day of the barometer for the month; Oct. 22, Nov. 20, Dec. 22, were the lowest. Feb. 15, 1820, and March 15, were highest days. Feb. 24 and March 24 were lowest days; April 23 was a highest day. May 1 and June 1 were lowest days; July 1 was a highest day. As to the thermometer, Jan. 15 and Feb. 17 were lowest days. March 6 and May 5 were lowest days; but April 5 was highest. March 30 was highest, April 30 lowest. July 31 was highest, August 29 was lowest.

Mr. Webster gives much statement and discussion with reference to transfers of heat and electricity, which he supposes to take place with some rapidity. These we shall not notice further; but shall put together a few remarks on another subject.

Here is a weather book in which the *moon* is dethroned. Mr. Webster's periods are solar. He says he has watched the moon's periods very attentively, without perceiving any effect. The belief in the lunar influence is of all countries and all times. It extends beyond the belief in monthly periods. We will recall a circumstance connected with our own columns as far back as 1849.

Our readers will remember—at least this is a way of beginning—that in December 1848 Dr. Forster, of Bruges, announced to the Astronomical Society that in weather journals kept by his grandfather, his father, and himself, from 1767 downwards, whenever the new moon fell on a *Saturday*, the following twenty days were wet and windy. The Society published this; and we expressed our approbation of their having done so, not having any idea that the statement had ever been made before. Our correspondents soon let us know that the Saturday moon had this character even in popular rhymes, that it is widely believed in among seamen, English, French, Spanish, and even Chinese. We referred the question to the

Saturday new moon of March 1849, which was then coming on, and this moon rather favoured the theory; for after dry weather a little snow fell on the Saturday, and the few following days were louring and rather wet. Now here is a curious circumstance: the whole world has the notion widely scattered that a Saturday moon brings wet weather, and science has hardly the means of being positive in the negative. And this is only one such case: curious effects of the moon are in the popular belief by scores, and there is no refutation, except *a priori*—that is, no refutation at all.

Every 29½ days is divided into two periods, one of which has many times as much moonlight as the other. That the moonlight must have a great deal of heat when it leaves the moon is highly probable; that it has none when it reaches the surface of the earth is certain. What then becomes of all the heat which it seems almost certain the moonlight brings with it? Sir John Herschel thinks that it is absorbed in the upper regions of our atmosphere: and that some probability is given to this supposition by the tendency to disappearance of clouds under the full moon: a fact observed by himself without knowledge of its having been noticed by any one else, and which Humboldt, he afterwards found, speaks of as well known to the pilots and seamen of Spanish America. If this theory be correct, there is a cause of weather cycles which must produce *some* effect: an enormous quantity of heat poured into the atmosphere during one half of the lunar month, and a very small quantity during the other half. In truth, it has been ascertained that the quantities of rain which fall in the four quarters of the moon are not quite the same in the long run.

But the popular mind gets hold of the question in a different way. It seizes upon the geometrical phenomena of the moon, nothingness, halfness, fullness, and makes the moments of these appearances the times at or very near which change of weather is to take place. According to the recognized old notions, it is enough if a change of weather takes place within three days one way or the other of a change, which gives twenty days every month in which a change is set down to the moon. No wonder this theory is often confirmed. The whole question of moonlight,—not position of the moon,—both as to its effects on the weather and its asserted effects on vegetable and animal life, is in the earliest infancy, so far as systematic observation is concerned. All that is said about it is mere infallibility.

Selections from the Correspondence of R. E. H. Greyson, Esq. Edited by the Author of 'The Eclipse of Faith.' 2 vols. (Longman & Co.)

No collection of real letters was ever so dull as this,—which recalls to us oppressive volumes of imaginary correspondence by Hester Hurdso, afterwards Chapone, by Mrs. Ord, and other wearisomely good elderly ladies, who brought their weariness and goodness to bear on the virgins of the rising generation. Compare them, ye who think us severe, with the real letters addressed by Wilhelm von Humboldt to his female friend, which are what these pretend to be—letters merely on subjects and sentiments—letters of sustenance and counsel,—containing hardly an anecdote, recording the fewest and commonest incidents. Yet those letters fascinate because they are a revelation of life, thought, contemplation, and friendship. Written to one, they speak to all. These epistles, written at everybody, will reach few or none. Yet they are on

all manner of topics that engage the mind of earnest men and imaginative women,—treating of homoeopathy, atheism, novel-reading, and other topics no less sage and sprightly;—yet beaten in interest by any real, ill-spelt correspondence, in which John makes love, and Sally "backs out" of the entanglement, because of her prudent anxiety to capture James. The real things in these Greyson letters are (perhaps) the illustrative anecdotes. We will give two: the first concerning a great orator, of whom we are never tired of reading or hearing:—

"I met last night, at the house of a friend in this place, one who knew the celebrated Robert Hall. Among other things, he told me he had heard that, when a student at Bristol, Robert had been brought before the College authorities for being present at a prize-fight! He defended himself half in jest and half in earnest, and to the great horror of the square-toes, confessed the fact, but denied any fault; on the contrary, contended that a prize-fight was a very instructive sight for a youth to witness! One can imagine the consternation of the seniors, while perhaps the young scampgrace insisted that it was a fine exhibition of vigilance, patience, and fortitude; as such, eminently desirable for a Christian, and most desirable of all for a Christian minister to gaze upon; that Paul himself had evidently been at many a prize-fight, as shown by his fondness for the imagery derived from it; that it was also a most melancholy exhibition of human depravity and corruption, and therefore full of solemn and tender suggestions to one whose business it would be to rebuke and correct iniquity; and, in short (for Robert was not the lad in those days to halt at a half paradox), that it was a singularly instructive and monitory spectacle for young ministers of the Gospel!"

The second is a telegraph tale:—

"I think the most curious fact, taken altogether, that I ever heard of the electric telegraph, was told me by a cashier of the Bank of England. You may have heard of it. It may have been in print. I am sure it deserves to be. 'Once upon a time,' then, on a certain Saturday night, the folks at the Bank could not make the balance come right, by just 100*l.* This is a serious matter in that little establishment: I do not mean the cash, but the mistake in arithmetic: for it occasions a world of scrutiny. An error in balancing has been known, I am told, to keep a delegation of clerks from each office at work sometimes through the whole night. A hue and cry was of course made after this 100*l.* as if the old lady in Threadneedle Street would be in the Gazette for want of it. Luckily on the Sunday morning, a clerk (in the middle of the sermon, I dare say, if the truth were known) felt a suspicion of the truth dart through his mind quicker than any flash of the telegraph itself. He told the chief cashier on Monday morning, that perhaps the mistake might have occurred in packing some boxes of *specie* for the West Indies, which had been sent to Southampton for shipment. The suggestion was immediately acted upon. Here was a race—lightning against steam! and steam with eight-and-forty hours' start given. Instantly the wires asked, 'Whether such a vessel had left the harbour?' 'Just weighing anchor,' was the answer. 'Stop her!' frantically shouted the electric telegraph. It was done. 'Have up on deck certain boxes marked so and so: weigh them carefully.' They were weighed; and one—the delinquent—was found heavier by just one packet of a hundred sovereigns than it ought to be. 'Let her go,' said the mysterious telegraph. The West Indian folks were debited with just 100*l.* more, and the error was corrected without ever looking into the boxes or delaying the voyage by an hour. Now that is what may be called 'doing business.'"

Neither of the above is particularly well told; and Mr. Greyson, we may add, by way of conclusion, is generally lumbering in the style of his persuasions and reasonings.

MINOR MINSTRELS.

Revenge; or, Woman's Love. A Melodrama in Five Acts. By George Stephens, Esq. (Copenhagen, Iversen; London, J. R. Smith).—Mr. Stephens—further announced on this title-page as "Professor of the English Language and Literature in the University of Copenhagen"—is not forgotten in London as one of the syncretic few or many whose deeds or misdeeds in the cause of drama some years ago, gave occasion to some enthusiasm, to a few magazine articles, and to not a little sarcasm among those who were not of the initiated. It may be feared that 'Revenge' will hardly win for its writer the popularity which his former efforts failed to secure for him. The Young Danes, further, are somewhat to be pitied who sit under "the profession" of English made by one who admits such language as the following into a drama, the form of which is poetical:—

Edgar. Yes! he at last had gotten his settler, Odo; A stout youth is he, and not badly pleased, But, bah! not so we match our blooming sister. Thanks to thy counsels, rob'd in dignity, I made him crave her—ha! ha! only think!—When Gold frees slaves no longer, and when Earlship—Like bells on fool's cap jingling—wakes a now!

The import of the foregoing passage will be dark to many Britons, as well as to sundry Danes. That we may not, however, be accused of over-fastidiousness in selection, we will at random something new about that old place, Home, which we find a few pages later:—

Rowena. The Home is not the Hearth-stone; 'Tis soul and life and blood in unseen oneness. Home from, if Providence lead, we leave shell only, The substance in our bosoms. Man's heav'n on earth Is Home and Wife and bonny Bairns; weak Woman's—Man's true Home is her earth-nest. There his Honor Guards she, as Vestals in old Roman temples Daily and nightly watcht their altar-fires. That Woman how blest! who, even mildly striving Round her a Home to build, some gentle grateful Home-lover finds, her poor most artless efforts Paying with sympathy—her bright soul-sunshine—And with warm kiss life's thoughtful dulness gilding! Small are my gifts, Lie! But, O bear with me; And with each moon my love more high shall rise, With softer grace my husband's smile shall robe me.

We do not imagine that the reader will cavil at us for not unfolding the story of a drama told in such amazing language. It is thickly interspersed with lyrics, which are less strange, perhaps, in quality than the above; and these have been mated with notes by Mr. Stephens himself, as our friends will find set forth in another place.

Cloud-shadows, Atcherly, and Miscellaneous Poems. By John William Fletcher. (Longman & Co.)—Out of some twenty books of verse now on our table we find Mr. Fletcher's to be the best. He shows a lavish wealth of words, and sometimes a lively fancy, without possessing much underlying power of thought. He is too fond of similes, and hints things too much with this looking-glass in hand. Fifty times in the course of twenty pages he tells us what things are like instead of what they are. All firm grasp of reality is soon lost in such vague and shadowy representation. We are sick of hearing that the Sun is "like a ship of Heaven," that a man lay "like a waste of waves, whirling and wild," that morning rose "like a mermaid," or the dying sun stood "like a stag at bay," that "noon lay like a panther by a fountain," and "night came like a monarch." This sort of thing bears about the same relationship to poetry as idiocy does to prophecy. And half of our makers of verse set up with this gift alone of finding similes in which other people find no similitude—being altogether adrift from the common sense of prose, and not having reached the common sense which brings the great Poet's imagination home to our business and our bosoms. Here is a good metaphor used as it ought to be:—

Surrounded by brave comrades, flushed with hope,
And fired by honour, 'tis an easy task,
When the commander signs, to cheer and charge,
And conquer, like the guards at Waterloo :
But 'tis a tenfold harder task to stand
Steady and stern upon the high hill-top,
Each burning impulse curbed, and no shot fired,
No footstep stirred, save when the living move
Up to the front ranks to replace the dead.
And so the soul, which would be truly grand
And solve the vast life-problem, must endure
As well as dare ; and patient, passive, proud,
Erect its front against a warring world.

We rather think that unconscious humbleness would stead the soul better than conscious pride in the life-battle, else the metaphor is put simply and well. It is a pity the author made such a mixture of his "Bachelor's Reverie," instead of keeping to the feeling of its refrain, which has in it the very music of a heart sighing its half-sad, half-sweet Heigho ! and the essence of a lifting lyric :—

O! they're all gone, all flown, all whirled away,
Like swallows with the summer, or the salt-sea spray.

For the sake of repeating that refrain we quote a few lines :—

Hey the days when eyes looked love,
And dimples raised delight,
And the palm an answering pressure gave
As the dear voice said "Good night."
Hey the days, the sunny days,
When trifles light as air
Could cause the fountains of the soul
To bubble fresh and fair.

O! they're all gone, all flown, all whirled away,
Like swallows with the summer, or the still sea-spray.

The Heroine of Scutari, and other Poems. By Edward R. Campbell. (Low & Co.)—We have found nothing to quote from this volume, and scarcely know how to characterize it. A countryman of the author's would have no hesitation in describing it as "a sorter poetry, and a sorter not; but a darned deal sorter not nor sorter."

Lauda Sion, Ancient Latin Hymns, translated by John David Chambers. (Masters.)—These hymns flow well in a good common-metre kind of music. Some of the illustrations are quaintly curious, very like etchings from old German missal-painting, and many of the initial letters have the charm of a flower freshness.

Songs for the Times. By Henry Hogg. (Simpkin & Co.)—This book is dedicated to the "Young Men's Christian Association," and the author pipes to the weakest of tunes the doctrines of the Peace Society's neophytes. He has fallen into the amiable mistake shared by many members of that body, of thinking that we are going to have done with fighting, that Cobden, Bright, and Elihu Burrit are to be our heroes now, and that if an enemy were to reach the heart of London, and they were to be driven into adopting the suggestion of Mr. Tennyson's last hero, and striking with the "yard-wand home," they would still give short measure. We are afraid, that with Chinese and Indian affairs on hand, the times are unlikely to listen to these well-meant 'Songs.'

Eva, and other Poems. By Caroline Giffard Phillipson. (Moxon.)—There is a quiet power of continuity in the longest of these poems which we like; but it is not charged with any weight of experience, and the form and phraseology are wearisomely conventional. We think there is some promise in the author's present verse attempts, and hope for her future, only let her wait till the flowers of poetry blow in the freshness of nature and the fullness of time, before she pluck them, and never mind about gathering the meanest weeds of praise.

OUR LIBRARY TABLE.

The History of England, from the Earliest Times to the Peace of Paris, 1856. By C. D. Yonge. (Rivingtons.)—From lexicography to history is a rapid advance. Mr. Yonge, however, applies himself to both with scholastic views. His new work

is in the form of a manual, the readers of which must be content to take the compiler's statements on trust, unsupported as they are, in most cases, by references. Though a compiler, he is not often a copyist, but melts down his materials into something like unity. There is need, now and then, of such a book, adapting for popular use the fresh materials offered by criticism, by letters, memoirs, and other documentary contributions to historical knowledge. Mr. Yonge has gone to the Grenville, Malmesbury, and Wellington Correspondences, and has elicited whatever testimonies they contain to new facts and positions; but one important admission in his Preface compels us to introduce his work to the young with a warning. He has not examined the inedited records of historical events in England. Accepting the result for what it is worth, we find a general Index, serving as a chronological table of occurrences from the year 900 to our own times, and a neat arrangement by which, at the commencement of new reigns, the names of contemporary sovereigns are given. The narrative style, though plain and unpicturesque, is vivacious, regular, and not wanting in dignity. What we miss is a faculty for clear and condensed historical exposition. Mr. Yonge escapes explanatory details, which an artist would work into his pattern, by a method leaving the relation often vague, as when he notices—for he does nothing else—the great Indian wars, or runs through the progress of the commonwealth. Moreover, his manner is everywhere conventional; his accounts of celebrated acts and characters bear the impress of no kind of originality; he moves steadily forward without an attempt at philosophical analysis, or at testing the opinions in vogue concerning the personages of the immortal drama. In point of fact, Mr. Yonge's 'History,' up to the opening of the present reign, is a vigorous, well-distributed compilation; beyond that point, it becomes meagre, loose, and altogether unsatisfactory.

The Sea-Officer's Manual in the Mercantile Navy. By Capt. A. Parish. (Smith & Co.)—The Mercantile Marine Service have to thank Capt. Parish for a very lucid and compendious manual. We would recommend youths intent upon a seafaring life to study it instead of applying for information to those compilers of answers to correspondents, who, with universal facility, lay down the law of revolving storms, the rules of etiquette, and the maxims of morality, and are as familiar with the theories of definite proportionality, complex affinity, and chromatic aberration as with the provisions of the last Act or the liability of lodgers to landlords. But Capt. Parish does not address midshipmen alone. His suggestions apply to first, second, third, and fourth officers, officers of the watch and even commanders, and include instructions for the administration and navigation of a merchant vessel in all parts of the world. The chapter on the duties of commanders, although modest, is particularly comprehensive. To midshipmen, however, the volume will be of the highest value, since it is calculated not only to facilitate the acquisition of such knowledge as is essential to their calling, but offers advice which, if adopted, would tend to heighten materially the character of the service in which they are employed. The whole is well put together, and written in a style of vigorous simplicity, which leaves little to be desired.

Proofs of the Interpolation of the Vowel-Letters in the Text of the Hebrew Bible, and Grounds thence derived for a Revision of its Authorized English Version. By C. W. Wall, D.D. (London, Whittaker & Co; Dublin, Hodges & Co.)—Perhaps we cannot do better than state, in the author's own words, the positions he has taken up in his ponderous and discursive essay. They are as follows :— "that the Hebrew Bible, as it issued from the pens of its inspired authors, was written without vowel-signs of any kind, whether points or letters :—that where Haleph, Yod, and Waw are now to be seen in the pointed text useless, and in the unpointed one diverted from their primary and proper use (of the same general nature as that of all the other elements of the Hebrew alphabet) to the occasional service of denoting vowels, they there constitute no part of the original writing, but were

interpolated in it not long after the commencement of the second century; that this interpolation of vowel-letters, in the main correctly executed, and which contributed essentially to preserving the legibility of the Word of God in the original tongue after the ancient Hebrews had ceased to be spoken as a living language, was yet due to an improvement in orthography which, as of foreign and of Pagan growth, the Jews were at first reluctant to admit even into their ordinary writing, and of which they were at length induced to extend the use to their Scriptures solely from violent aversion to Christianity, and with a view to evade the force of prophecies bearing on the divinity of Jesus and on his identity with the promised Messiah; that, accordingly, it is in several passages of Holy Writ designedly wrong, and in a great many more is so without design, through the haste with which, from a desire of concealment, the operation was conducted ;—that the Samaritans having also, in imitation of the Jews, introduced vowel-letters by stealth into the Pentateuch, with like precipitation and from like motives, their vocalization abounds with similar faults, both intentional and unintentional; but that these faults are frequently neither the very same, nor occurring in the same places, as those committed by the Jewish vocalizers; the two sets of scribes having scarcely agreed with each other, in any other respect but in the feeling they entertained in common, of bitter hostility to the Christian religion." It will be obvious from this statement, that the work is more theological than philological, and as such cannot receive an extended consideration in our columns. As to the author's learning there can be no question; but it is not so certain that all readers will be prepared to accept his conclusions. One probable effect of his "disclosures" would seem to be a still greater diversity of opinions deduced from Scripture than at present exists, inasmuch as both the vowel-letters and vowel-points in every word may be varied pretty much according to the taste and predilections of each student. Whether this be a desirable result, we must leave it for others to determine. The proposed corrections of the Authorized Version are mostly of a trivial or controversial nature.

The following are miscellanies connected with the general subject of education, and its special branches :—Dr. John Young's *Primary Instruction the Want and the Right of the British People; Annual Report (1857)* of Owens College, Manchester ; *The Educational Conference: its Probable Results; The Education of the Lower viewed in connection with that of the Middle Classes in general*, by T. D. Acland ; and a third edition, by "An Officer," of *Hints to Young Soldiers*. The reader in search, not of teaching, but of eccentricity, may find it, if he find anything, in *Desultory Reflections*, by G. M. S.—two pamphlets, full of "poetical" incoherence; while for insipid truisms, he need go no further than *The Elements of Human Happiness*, by Thomas Wainwright.

Mr. Edmund F. Moore has been at the pains to publish *The Cases of Westerton against Liddell (Clerk), Horne, and Others; and Beal against Liddell, and Parke, and Evans, &c.* : being a report of the entire proceedings in the several courts, and before the Privy Council. The volume does credit to the patient industry of its compiler.—In *A Manual of the whole Scripture History*, Mr. J. E. Riddell offers a compendious narrative of sacred history, which appears to be, as the author says it is, the result of considerable thought and research.—Mr. H. A. Woodgate's *Anomalies in the English Church no Just Ground for Receding* is an argument elaborately conducted.—There is more monotony than elaboration in a dull treatise reprinted from a newspaper, and entitled, *Church Parties: the Evangelical, the Tractarian Movement, the Broad Church*.—*How to make better Provisions for the Cure of Souls out of the Present Actual Finances of the Church* is a somewhat remarkable contribution to an old-standing debate.—We have two sermons—*The Divine Intention of the Gospels Vindicated*, by Orlando T. Dobbins, LL.D.; and *A Sermon preached at the Reopening of Runham Church, Norfolk*, by the Rev. S. Arnott, M.A., published by request. The Registrar-General has produced his *Eighteenth Annual Report of Births, Deaths, and Mar-*

riages in England. It indicates, for the year 1855, diminished social prosperity, a large mortality, and fewer marriages than usual.—Another statistical publication is, *On the Statistics of the British Land-Tax Assessment, and particularly of England and Wales, from 1836 to 1856*, by Frederick Hendriks. From Mr. W. L. M'Phin we have *The True Principles of Currency Explained in a Report of Evidence submitted to a Committee of the House of Commons, now sitting on the Bank Acts of 1844-45*,—from Mr. G. W. Hastings, *The Authorized Report of the Mercantile Law Conference of 1857*,—from Mr. J. Staley, sundry notes on *The Surplus Income of the Nation; its Use and Abuse*,—and from Dr. S. H. Ward, a pamphlet *On the Medical Estimate of Life for Life Assurance*.—Foreign topics are treated in a body of *Documents illustrative of the Application of Article 84 of the Treaty of Paris in Moldavia*—[*Documents pour servir, &c.*],—and *Will not Persia initiate Turkey by becoming a Dependency of the Great European Confederation?* by M. A., who drags Nebuchadnezzar into the entanglement of Anglo-Persian Politics.—*The Crisis in India: its Causes and Proposed Remedies*, is professedly the work of a military officer of thirty-two years' experience in India.—Mr. Charles Beggs issues an essay entitled *The First Steps to Irish Liberty*.—Mr. James Adam, a neat *Description of the Province of Otago, New Zealand*,—and Mr. Gilbert J. French, *Remarks on the Mechanical Structure of Cotton Fibre*. On personal matters we find on our table a variety of miscellanies,—two pamphlets by Mr. T. S. Prideaux, *Treatment of an Inventor by the Admiralty*,—and *Dishonesty Exposed: a Legal Review of the Case of Dred Scott, an American Fugitive*.—*The National Gallery*, being Mr. Morris Moore's last publication on one of Sir Charles Eastlake's purchases,—and *Who Killed Angelier?* by Scrutator, who adopts the view that the person accused was wholly innocent.

LIST OF NEW BOOKS.

Barwell's *Care of the Sick*, 2nd edit. 8vo. 12 s. dwd.
Bibliotheca Classica. 'Terence, Commentary by Parry,' 18s. cl.
Brontë's (Charlotte) *Life*, by Gaskell, 3rd edit. 2 vols. or. 8vo. 24s.
Burns's *Ornamental Drawing and Architectural Design*, 3d. cl.
Cope's *Pictas Privata*, 32mo. 1s. cl. swd.
Cope's *Geology*, 8vo. 19s. cl.
Davidson's *Drawing for Elementary Schools*, post 8vo. 3s. cl.
Dumas's *Vicomte de Bragelonne*, in 2 vols. Vol. 2, 8vo. 2s. 6d.
English Poetry for the Collegiate Schools, 48s. cl.
Guy's *Leather's Poetic Task*, 3rd edit. 12mo. 1s. cl.
Hawthorne's *Mosses from a Marriage-Table*, 1s.
Lessons on Phenomena of Industrial Life, edit. by Dawes, 2d. 2s.
Life of a Sportsman, by Nimrod, illust. royal 8vo. reduced to 16s.
Lynch's Story of my Girlhood, post 8vo. 10s. 6d. cl.
Macdougall's *Outlines of Modern Geography*, 12th edit. 2s. 6d. cl.
Mallory's *Geography*, 12mo. 1s. cl. swd.
Morell's English Grammar, or. 8vo. 2s. cl.; with Exercises, 2s. 6d.
Noble Traytor, by Thomas of Swarreford, Armiger, 3 vols. 31s. 6d.
Oper's *Across the Channel*, 18mo. 1s. cl.
Reed's *Early Days and Social Familiy*, 2s. 6d. bds.
Reed and Head *Life in Sir John's Worcester Abbey*, 2s. bds.
Steggall's (John H.) *A Real History*, edited by Cobbold, 7s. 6d. cl.
Stroud's *Index to the Gospels and Acts*, or. 8vo. 1s. 6d. cl. swd.
Squire of Beechwood, a True Tale, by 'Scrutator' '3 vol. 31s. 6d.
Train's *Young America Abroad*, post 8vo. 3s. 6d. cl.
Trollope's *Good Queen Bess*, 12mo. 1s. cl.
Trollope's *Love and Jealousy*, or. 8vo. 2s. bds.
Trollope's *Robertson on their Travels*, 8vo. 1s. 6d. bds.
Walmsley's *Journal of a Basohi Bazaar*, 12mo. 1s. cl.
Wayside Gatherings, by E. M. T. or. 8vo. 3s. 6d. cl.
Wells's *The Good Old Days*, their friends, preface by Mrs. Stowe, or. 1s. 6d. cl.; post 8vo. 3s. 6d. cl.
Young's *Angler and Tourist's Guide in Scotland*, 18mo. 2s. cl.

FOREIGN CORRESPONDENCE.

Naples, Aug. 17.

THE lava is flowing down from Vesuvius in two several branches, though not in any great body. Meanwhile a third outlet higher up has been opened, from which volcanic matter is being thrown out. In consequence of this, and the stones which are projected from the volcano into the air, the ordinary access to the summit is rendered impossible, and people now ascend by Torre del Greco. Professor Palmieri, however, is of opinion that the eruption has not increased since his last report, but that only that has happened which he had foreseen, namely, that the lava issuing from the crater of the 19th of December, 1855, accumulating for some days, would take the direction of the Punta del Palo, following the natural inclination of the soil. This happened, indeed, on the 16th of last month, when the fiery torrent, pursuing the direction described, filled up the abyss opened in 1854 in a few hours. It then began to throw itself over the rapid sandy sides of the cone, following the course made by the celebrated eruption of 1855, without any probability of arriving at the lava in the Fosso della Vettana, where the population of

Massa and S. Sebastiano are now trembling with fear. The smoke has often presented the phenomenon of circles described, as far as I can recollect, in the first instance, by Sorrentino. Amongst the few productions collected on the fumarole, which are very scarce, I found silver, which I do not know has been found by any other person. It has not only been shown to me by the usual reagents of the chemists, but I have succeeded in seeing it in the clearest manner by means of the 'ettolisi,'—which I propose to apply to other researches of the same kind, as the analysis of Vesuvian productions is often intricate, in consequence of the productions alluded to being much intermixed. I am, therefore, disposed to think that by electro-chemical means I may be enabled to discover easily not only some bases, but also several electro-negative substances." To this I add another report, published in the official journal of the 13th of August, by Prof. Palmieri, which will not be without interest to the scientific world:—"Two hours before dawn, by moonlight, I ascended Vesuvius for the thirtieth time during the present eruption. The two mouths continue to show almost the same degree of activity, with detonations less loud perhaps, and the eastern cone has become higher. It is curious to see how the lava, which had filled up the great vortex of the 19th of December, 1855, having become hardened at a great depth, on the arrival of the new lava, which bubbled up from beneath, has floated on the surface of it more or less fractured; so that at present it may be seen lifted up above the edge of the vortex of which I have spoken, to the height of several metres, thus offering to the eye of the spectator the appearance of great pilasters of basalt wrought by the human hand. Meanwhile the lava which issues from beneath this floating débris, on flowing towards the western base of the Punta del Palo, is covered over with scoria, on which one may walk with impunity; on the upper part of the mountain, however, it flows concealed from the eye of the curious, becoming visible on the descent. Its course is still that which it took from the 16th of July, when the path up to the top of the cone was occupied by it. The lava belongs for the most part to that kind which displays a black and close surface on becoming hard, is more or less angular, and with a great many indentations. This would lead one to expect that the lava was more liquid and flowing; yet such is its tenacity, that it descends very slowly over a rapid inclination, and offers great resistance to an iron bar driven into it with great force. In this state on the inclination of the cone it presents a temperature of 1,000 degrees of Centigrade, proved by the easy fusion of wires of pure silver. Before the 16th of July, as you are aware, the lava flowed down on the eastern side of the cone, and was invisible from Naples; on that side it now appears to be completely hardened, though it cannot always be walked upon with safety, not so much on account of the heat as on account of the angle of inclination. There is one spot where an immense quantity of swallows are constantly circling about, attracted by the insects perhaps which crowd around those smoking apertures. This opinion of mine becomes so much the more reasonable because the insects, which I have noticed several times, and which during the past spring had almost disappeared, have again shown themselves recently, especially in the new fumarole towards the south-eastern part of the cone, with this difference, that some species on other occasions very common are now as rare, as the 'curecione,' and others which were more or less rare, are now as abundant, as the 'crisomele,' and the 'vel.' Many new apertures have been opened on the south-west part of the cone, and those on the opposite side have become weaker. All the first give clear indications of sulphuric acid, whilst in some of the older openings hydride of sulphur is perceptible. The new apertures presented some time since boric acid, which up to this time has never figured in the catalogue of Vesuvian productions, and other matters I have recently collected which I have not yet had time to test. In general, the top of the mountain is more than usually covered with white and yellow flowers of 'gesso,' and clorure of iron. The new openings show in preference common salt. The

Punta del Palo, which was threatened with destruction, has not only been propped up by recent lava, but partly buried by it." As Vesuvius is now more than ever an object of interest, I shall continue to send to the *Athenæum* the picturesque and scientific Reports of Prof. Palmieri.

H. W.

OUR WEEKLY GOSSIP.

THE submarine cable between Europe and Africa has been successfully laid down; and the fact will be encouraging to all those Croakers who see in the momentary failure of the Atlantic line a cause of despondency. The Mediterranean cable failed at the first trial, and has succeeded at the second. Messrs. R. S. Newall & Co. have published the following note:—"We have the pleasure to inform you that a telegraph despatch from Cagliari, dated September 9, announces to us that the submarine cable connecting Europe and Africa has been successfully laid between Boni and Cape Teulada. The communication between Teulada and Spartivento, a distance of 17 miles, has to be made before regular telegraphic communication can be opened with Algeria. The cable is a heavy one, with four conducting wires, and has been laid successfully in above 100 nauts of 1,600 to 1,700 fathoms water. The total distance covered is 124 nauts, or 145 miles."

Unfavoured by weather, the concluding Flower Show of the Crystal Palace enjoyed a certain degree of success. The display was striking, considering that September is not a flowering time, and the throng of visitors, on the middle day especially, was considerable.

The 'European Statistics of Suicide,' recently published in France by M. Lisle, show that England is no longer at the head of the dreary poll. The French author proves that France is highest in the scale, and Russia lowest. In London, we have one suicide in 8,250 people. Paris gives one in 2,221. For the whole English population, the suicides reckon one in 15,900; France, one in 12,489. The north of France is the most prolific in suicides, that district yielding nearly half of the whole number in the entire empire.

The Rev. George Phillips, B.D., Rector of Sandon, Essex, has been elected President of Queen's College, Cambridge, in the room of Dr. King, deceased.

As botanists have constructed a flower-clock, so (we read in the foreign journals) a German woodsmen has recently invented an ornithological clock, by marking the hours of the waking and the first notes of the little singers. The signal is given by the chaffinch, the earliest riser among all the feathered tribes. Its song precedes the dawn, and is heard in summer from half-past 1 to 2 o'clock, A.M. Next, from 2 to half-past 3 o'clock, comes the blackcap (*Sylvia atricapilla*), whose warblings would equal those of the nightingale if they were not so very short. From half-past 2 to 3 o'clock the quail is heard. From 3 to half-past 3 the hedge-sparrow. Then from half-past 3 to 4 o'clock, we have the blackbird, the mocking-bird of our climates, which imitates all tunes so well, that M. Dureau de la Malle made all the blackbirds of a French canton sing the *Marseillaise* hymn, by letting loose a blackbird which had been taught that tune. From 4 to half-past 4 o'clock the lark pours forth its melodies; from half-past 4 to 5 o'clock the black-headed titmouse is heard. Lastly, from 5 to half-past 5 o'clock, the sparrow, the *gamin* of the skies, awakes and begins to chirp.

Messrs. Kelly & Co., the compilers of the 'Yorkshire Directory,' say in a note alluding to our remarks on the old rhyme:—

My lord is my lord for a year and a day;
But my lady's my lady for aye and for aye.—

"We are informed that the local practice as to the title of the Lady Mayoress still exists among the Corporation and older citizens of York."

French papers announce the death of M. Auguste Comte. This thinker—the founder of what is called the School of Positivism in French Philosophy—has been more written of in this country than even in his own, thanks to the persistence through good and evil days of two or three very energetic disciples. More has been written, per-

haps, than has been relished or read; for M. Comte's teaching, like that of his famous compatriots, Prudhomme and Fourrier, has been of a kind and a tendency not likely to prove acceptable beyond the circles of very strong-minded ladies and very exalted gentlemen.

"As supplement to my few words about the new Continental route," writes a friend, "let me add a line, to commend Metz as a halting-place. For the military traveller, it has its fortifications; for the lover of architecture, its rich Cathedral (in the somewhat over-blown and florid style of the latest French Gothic); for those who only generally care for the picturesque, its pleasing situation and its lovely public gardens on a platform high above the Seille and Moselle. Anything gayer than these on one of the late summer evenings can hardly be imagined. The town is clean, though its streets are narrow; and the people, though speaking a hybrid *patois*, have a brisk and thriving air. I have not seen yet a French provincial town more attractive and less stagnant.—P.S. In the route aforesaid, the traveller will have a chain of fine churches under his hand, such as could hardly be exceeded for variety within the compass of two days' journey—those of St. Quentin, Laon, Rheims, Toul, Metz, and Spires—all before Mainz is reached."

The thirty-third annual meeting of the German Naturalists and Physicians will take place at Bonn, on the 18th of September and following days. A numerous attendance, from all parts of Germany, is anticipated. The German Artists meet this year, for the second time, at Stuttgart.

Chevalier Bunsen is preparing a new German translation of the Bible. The work is to consist of three sections, in seven volumes, and the publication will begin towards the end of this year, at Leipzig. The first section, comprising four volumes, will be entitled, 'Die Bibel, oder die Schriften der Alten und Neuen Bunder, nach den überlieferteren Grundtexten volksmässig, und treu übersetzt und für die christliche Gemeinde erklärt.' The second section, in two volumes, is to bear the title: 'Bibel-Urkunden, oder die Schriften der Alten und Neuen Bunder, geschichtlich und nach der Zeitfolge geordnet und für die Gemeinde erklärt.' The third and last section, in one volume, is entitled: 'Bibel und Weltgeschichte, oder das Leben Jesu und das ewige Reich Gottes.'

A friendly critic warns us that 'City Poems,' by Mr. A. Smith, cannot be enjoyed until the second or third reading. Out of curiosity we have tried again—having on a former day read them hastily, and given our readers the impression they produced upon us *hot*. We are more convinced than ever that these 'Poems' constitute the most singular literary curiosity of our time. Poetical substance, poetical structure, have not been claimed for them in any quarter; and the glow of line and the sparkle of images which are claimed for them appear to be drawn from the composer's memory, not from his imagination. We believe it would be easy, with a little industry, to restore *every bold line and every good image* which figure in 'City Poems' to the real owners. We make the following restitutions (in addition to former offerings) as the result of a second perusal:—

SMITH.
Joy, as he went laughing
past,
Crushing a bunch of grapes
against his lips. (p. 6.)

KEATS.
—burst Joy's grape against
his pale fine.
(*Ode on Melancholy.*)

POE.
An angel strong, winged,
bedight
In veils, and drowned in
tears,
Sit in a theatre, to see
A play of hopes and fears,
* * * * *
The play is the tragedy,
"Man."
(*The Conqueror Worm.*)

MILTON.
—stoutly struts his dames
before.
(*I. Allegro.*)

COVENTRY PATMORE.
A shrill defiance of all to
arms,
Shriek'd by the stable-cock,
received

An angry answer from three
farms.
(*Angel in the House.* vol. i. p. 62.)

Chanticleer, that struts
Among his dames; faint
challenged, claps his wings,
And crows defiance to the
distant farms. (p. 12.)

SMITH.
This crumbling shoal of
Time. (p. 20.)

SHAKESPEARE.
This bank and shoal of Time.
(*Macbeth.*)

MARLOW.
Shallow rivers to whose falls.

KEATS.
A casement, &c.
—twilight saints and dim
emblazonings,
* * * * *

Rose-bloom fell on her hands,
together prest.

TENNYSON.
—gleamed on by the flying
moon. (p. 77.)

The torrent raging down the
long r'vine. (p. 41.)

SHAKESPEARE.
The long brook falling down
the clov' ravine.
(*Emone.*)

COLLINS.
Her soul-subduing voice ap-
plied.

TENNYSON.
The thousand waves of wheat
That ripple round the lonely
grange.
(*In Memoriam.* lxxxix.)

STREAKS OF RAIN FALLEN
ON THE YELLOW WOODS.
(p. 111.)

HEAVILY THE LOW SKY RAINING
("Lady of Shalott.")

—steaming floods.
(*In Memoriam.* lxxxix.)

AND O'er the frith that
branch and spread
Their ships.
(*Ibid.* conclusion.)

SHAKESPEARE.
Which fires the proud top of
those eastern pines.

WORDSWORTH.
As on a sunny bank, a tender
lamb

LURKS IN SAFE SHELTER FROM
THE WINDS OF MARCH,
SCREENED BY ITS PARENT, SO
THAT LITTLE MOUND—

[i.e. a grave.]

—*Excursion.* b. vi.

LIKE BEDS OF SUNLIGHT SHIFTING
ON THE BRINE.
(*Epistle to Sir G. Beaumont.*)

ALLINGHAM.
Chequer'd with woven sha-
dows as I lay

AMONG THE GRASS.
The liquid thrills to one gold
flake.

WORDSWORTH.
Like an army defeated
The snow hath retreated.

TENNYSON.
Unto dying eyes

THE CASLEMEN SLOWLY GROWS
A GLIMMERING SQUARE.
(*Princess.*)

COLLINS.
They fingers draw dewy
The gradual dusky veil.

(*Odd to Evening.*)

LOOSE AS THE FILM THAT FLUTTERS
ON THE GRATE.
(p. 125.)

COLE RIDGE.
Only that film, which flutter-
ed on the grate.

(*Frost at Midnight.*)

TENNYSON.
—bays, the peacock's neck
in hue.
(*The Daley.*)

—sees a great black cloud
Drag inward from the deeps,
"a wall of night."

DRINKING THE SUNLIGHT FROM
A HUNDRED GLENS;
BLACKENING HILL BY HILL;
SMITING THE SEA'S

BRIGHT FACE TO DEADLY PALLOR;
TILL AT LAST

IT DROWNED THE WORLD FROM
VERGE TO VERGE IN GLOOM.
(p. 145.)

—purple thunder-gloom.
(p. 134.)

HIS LONG BLACK SHADOW
STRETCHING O'er the sands,
LONG AS EARTH'S SUNSET
SHADES.
(p. 123.)

SMITH.
My slumberous being closed

Its weary leaves

In drowsy bliss, and slowly

sank in dream,

As sinks the water-lily 'neath

the wave.
(p. 142.)

AND FAR ABOVE THE REGION OF

THE WIND.
(*Ibid.* vii.)

BRING ME LOVE'S HONIED

NIGHTSHADE; FILL IT HIGH;

I KNOW ITS MADNESS.
(p. 155.)

THAT RANGE ABOVE THE REGION

OF THE WIND.
(*Ibid.* vii.)

—THE CHERL MADNESS OF

LOVE,
THE HONEY OF POISON-FLOWERS.
(*Maud.* iv.)

—WE DOUBT WHETHER OUR CONTEMPORARY IS WISE

IN RECOMMENDING READERS WITH MEMORIES TO TRY A

SECOND AND A THIRD TIME AT MR. SMITH'S "CITY

POEMS."

FINE ARTS

A Guide to the Knowledge of Pottery, Porcelain, &c.; comprising an Illustrated Catalogue of the Bernal Collection. By H. G. Bohn. (Bohn.)

If we are to be a nation of artists the sooner we become successful ones the better. To help this desirable consummation Mr. Bohn published an illustrated Catalogue of the Bernal treasures; appended to it the prices at which every cup and saucer was sold, and the names of the present possessors; adding to this curiosity a learned and not dull essay on pottery and porcelain, with a list of marks and monograms for reference. To instruct the good people of Richmond at a lecture Mr. Bohn ransacked the works of Brongniart, Rioceux, Du Sommerard, Passeri, Labarte,—not to mention the careful catalogues of Messrs. Robinson, De la Beche, Reeks, Hunt and Maryatt.

Beginning with the Egyptian blue enamel, the Etruscan black, whites and reds, and the Corinthian black glaze, Mr. Bohn passes on to the Greek blue glass amphoras, and thence to Venetian glass and Byzantine and Limoges enamels, till he comes to the Florentine goldsmith, Lucca della Robbia's white opaque bas-reliefs, and the coloured fruits of Girolamo, that decorated Francis the First's *Château de Faience*. Then came the Majolica, imitated from Moorish works. Mr. Bohn derives the name, not from Majorca, from whence the Pisans brought specimen Moorish dishes, but from the Maioli family of Ferrara, who in the fifteenth century were great promoters of the Fine Arts. Aldus printed for the Maioli, and the bindings of their books are still of great value. It is not likely that Raphael furnished designs for the Majolica, and the best specimens of the art are of later date than 1520, when he died; but it is certain that within his birth-place was one of the emporiums of Faience, and that Duke Guidobaldo bought up his sketches to decorate his pottery. The *Amatorie*, or lovers' presents, produced a demand for the Majolica, which was kept in families as heir-looms. The revival of Majolica was at Naples; but, as usual, when the drawing grew more correct, the colour grew thinner and colder.

The Italian marriage of Henri the Second in 1533 introduced Majolica into France, and the genius of Palissy gave it a local habitation. Genius, that works with simple things and dignifies all it touches, turned the frogs and worms of the Seine into forms of beauty, and from the river-mud Palissy made jewels to decorate kings' palaces. Escaping St. Bartholomew he died in the Leaguers' Prison, and was buried in the clay he had buried himself in all his life. We have passing notices of German stone-ware, Rouen, Faience, and the early Japanese imitations of Delft. In Elizabeth's reign English imitations of Low Country ware, Fulham, Lambeth, and Staffordshire, began. Wedgwood, the son of a poor Burslem potter, from 1760 to 1795 revolutionized English pottery by his cream-coloured Queen's ware, his Flaxman cameos, and copies of the Portland Vase.

The Chinese built porcelain towers long before even the Moors wrought the clay of Spain into vitrified flowers. Their semi-opacity was the wonder of the early Portuguese traders, who believed them to be made of egg-shells and powdered cowries. The egg-shell, the crackle, the ruby colour, the sea green, turquoise blue, the citron yel-

lows, were the passion of European ladies. The josses and teapots—mere objects of vulgar use in China—came in Europe curiosities and treasures. The Japanese porcelain is distinguished by its brilliant yellows, blues, and reds; its simple ornamentation, bold relief, and perforated work.

The first discovery of porcelain in Europe was accidental. The scientific mind, anxious and prepared for the discovery, was ripe for all indications of the secret. Bottchen, a Berlin apothecary's assistant, who dabbled in alchemy, was accused of being a witch, and fled to Dresden. There the king, believing he could make gold, put him in his laboratory, where he by accident stumbled on the discovery. The king, afraid of his escape, secrets and all, locked him in a fortress, and eventually allowed him to pursue his experiments in the full sunshine of his favour. In 1715, after long watchings at the furnace, he brought his secret to perfection. The feet of an iron-master's horse accidentally sticking in some soft white earth caused the discovery of the kaolin or natural paste. Extraordinary secrecy was maintained by the king in his works. Jasper-coloured and gros blue ware, ornamented with Watteau subjects, are the great triumphs of Dresden work. A fugitive workman carrying the secret to Vienna, it soon spread through Germany. Vienna became renowned for its gilding; Höchst for its violet reds and deep blues; Ludwigsburg for bistro drawings; Berlin, under Frederick the Great, for beautiful paintings.—Fritz having carried off by force all the noblest artists from Dresden, encouraging Art, as Napoleon did, by robbing another country.

In George the First's reign, under the protection of "Butcher Cumberland," a German tried the china-making at Chelsea. The paste is soft, the colours, a wavy blue, claret red, canary yellow, and sea-green, with rich gilding. Its rival was the Stratford-le-Bow manufactory. To these succeeded Derby and Worcester.

The foreign wares are soon summed up. First comes the St.-Cloud, where an artist, after forty-five years of experiment, discovered an artificial soft paste. Runaways carried the secret to Chantilly and Vincennes. In 1756 Louis the Fifteenth took up the luxurious manufacture, and the factory was removed to Sèvres, under the patronage of Madame de Pompadour. The true hard paste was not made here till 1768, when the wife of a poor surgeon found the true kaolin of China in a ravine, where she mistook it for fuller's earth. The true Sèvres glories in its colours of Bleu-de-Roi, jonquille, Rose Dubarry, vert pré, and oil de perdriz. A pair of these vases sells for more than a thousand pounds.

Italy boasts of its Capo di Monte and Doccia wares, and Spain of its Buen Retiro, which is rare and beautiful.

So much for Mr. Bohn's useful and careful sketch. As for the collection itself, it is too recent in the remembrance of the Art-public to need much recalling. The pictures arise before us as if we saw them but yesterday. Mignard's Duke of Burgundy in armour, with the ribbon of St.-Esprit, and Louis the Fifteenth in the armour he played with; Frederick of Nassau in his green dress and red scarf, and Prince Maurice in gilt armour, on a white charger; Madame de Pompadour in the white of innocence, Fulke Greville in a white ruff; Marshal Vauban in buff, and Maria Theresa in yellow velvet.

Again, with the gloating eyes of an antiquarian marine-store-dealer, or one of those hook-nosed men with fluffy white hats, who rub pictures at sales with wet fingers, we run over the precious stores of ancient metal. The old embossed caskets, reliquaries, pikes, brass almanacs, candlesticks, and dyptics; the processional crosses and chalices; the old jewelry of by-gone beauties; the silver bocales and parcel gilt drinking-cups. Again, we run our critical hands into the cross-guards of old Solingen rapiers, and mark with delight their fluted pommeled blades, the rings for the thumb, the cross-guard hilts—all recall to us *Gil Blas*' days, when such tools were daily companions. We can here at our leisure run over with wistful recollection the sweeping halberds, with their ox-tongue blades pierced and engraved, the stocks inlaid with

mother-of-pearl and ivory, and the steel covered with engravings of Scripture subjects. We remember how we spelled out *Lepanto* through these steel hammers inlaid with gold,—these chased powder-flasks,—these engraved gauntlets chased with trophies,—these wheel-lock pistols, and ivory cartouche boxes,—these embossed bucklers,—these russet and silver Burgonets with corded combs,—these damascened back-pieces and peaked visors,—these fluted corsets.

On turning over this Catalogue as we pleasantly recline at the foot of a wheat-stalk, we recur to special favourites among the curiosities; such as the Pretender's knife and fork, the beautiful miniature, by Cooper, of the handsome Viscount Falconberg, Cromwell's son-in-law, the old silver brooch that a tinker made for Maclean of Mull, the portrait of the voluptuous young Du Barry, the Watteau snuff-boxes, George the First's watch, and other such delights. But especially we glory to fit up certain snug lodgings of fancy with the old Bernal furniture, the or-molu clocks held up by Cupids, the Cinque-cento girandoles, the tulip wood and kingwood secrétaires, the marqueterie tables, with flowers and trophies, the buhl tables, with caryatid flowers, and arabesques, and the carved Venetian chairs. Old memories lurk in these drawers, where stains and scratches are so many legends of the past, where old faces look out from the dark seas of these mirrors, and meet us as we look in. Dons and cavaliers, princes and demiprinces, look from behind the tapestries enumerated in this Catalogue, and the shadows are sold with the wonders with which they are associated. But to the mindless, unpoetical man, to buy these old-world things is only to resemble the old gentleman who bought *Punch* and wondered the puppets did not begin the performance. Mr. Bernal's collection has now for ever been un-collected. The china is parted, and has taken refuge in a thousand cabinets, again to be dispersed. The old armour has gone to be stared at and sneered at elsewhere, or to be taken to pieces by Wardour Street dealers, like so much shell-fish at an oyster supper. The swords will cut flesh no more, but will rust as before in museums and armouries. The stained glass will catch other lights, and ebony yield to the blows of Time, who hates restorers and preservers, except picture-restorers who destroy, and life-preservers which slay. One of the saddest sights in this tear-watered world is such parting as this. The removing of old pictures from old walls, the turning of keys for the last time in old doors, the shutting for the last time of old windows. It is like the last look at a dead face, the last shake of a dying hand, the last listening to the last word; and yet it is something to amuse thirty or forty years of this unsatisfactory life with such wise toys,—and as there are things worse to part with at the grave's edge than even Sèvres tea-cups and buhl tables, let us not lament a dispersion that has stripped one house only to multiply the pleasure in a thousand other homes.

FINE-ART GOSSIP.—Our Tudor Roses should be looked to. In the Lady-Chapel at Chester Cathedral, now undergoing thorough repair, the workmen were told to be especially careful of the central-boss forming the well-known Tudor Rose. But the rose, as soon as touched, shed all its petals, and threatened to fall in clouds of dust. Renovation being out of the question, examination followed, and behind the fragments of the old rose was discovered the original boss, a fine piece of workmanship representing figures, the chief of whom is Christ. At the Reformation, when orders were issued to destroy superstitious representations, Chester, no doubt, had its decree. How must the old Dean have laughed, and how faithfully must he have been served, when instead of hammering into fragments the old carving, he covered it with a plaster emblem of loyalty, the Tudor Rose! But, by whomsoever done, he rendered good service, for which he has our gratitude.

The following note corrects a clerical error of last week:—

"5, St. Mark's Crescent, Regent's Park, Sept. 9.

"I observe in your impression of the 5th inst. an intimation that permission had been received to

erect a statue of 'James' in Trafalgar Square. I do not know if this is a clerical error, but I think it right to inform you that such permission has been granted for the erection of the statue of Dr. Jenner, the discoverer of vaccination, by Mr. Calder Marshall, R.A. The expense of this monument has been raised by contributions from all nations, and we owe many thanks to our foreign friends for their liberal subscriptions.—I am, &c., GEO. V. VERE IRVING, Hon. Sec. Jenner Monument."

Herr Zumbusch, the Munich sculptor, has completed his colossal statue of Bishop Otto von Freising. It will find its place on the square of the Cathedral, at Freising, and is described as a magnificent figure of white limestone, representing the celebrated priest (the cousin, or, according to some historians, the illegitimate brother of Frederick Barbarossa) in the episcopal costume of the twelfth century, and with the attributes of the Crusaders.

The first of the *bassi-rilievi* for the monument to be erected, at Moscow, to Czar Nicholas, has been completed by M. Ramasanow, the Moscow sculptor. It represents the cholera riots, in 1830, when the Emperor, as will be recollect, suddenly appeared among the enraged populace, and, by calling out to them with a thundering voice, "Down upon your knees!" made them obey and disperse. The second *rilievo* represents a scene from the revolution of the 14th (26th) December, 1825; the third, the surrender of Görgy; and the fourth the arrival of the Imperial family at Moscow by the newly-opened railway.

MUSIC AND THE DRAMA

HAYMARKET.—A Shakspearian revival at this house is generally so beneficial in raising the standard of acting on the part of the company, that we are always happy to record instances, occurring as they do at long intervals, and on special occasions. On Monday such an opportunity occurred on the first appearance of Mrs. Catherine Sinclair, who, presuming on an American reputation, essayed on that evening the character of *Beatrice*, in 'Much Ado about Nothing.' The lady was well received, and showed, though nervous in the early scenes, no inconsiderable acquaintance with the stage. Her performance was marked, however, by much care and caution; and she was more successful in the passionate than in the witty speeches. The scene with *Benedict*, after the repudiation of *Hero*, was accordingly acted with a spirit that strongly contrasted with those that had preceded; and the audience insisted on giving the *débutante* an immediate ovation. Mr. Howe shared the honour, and deserved it, for his *Benedict* was distinguished by many felicities of histrionic expression, which commanded the repeated plaudits of the house. Mr. Howe's industry in his professional studies is now bearing its natural fruit, and his assumptions have all the merit of ripened talent. The career of Mr. Howe is of good example to all stage aspirants, and therefore solicits critical recognition as much on general accounts as on the score of individual deserving. The part of *Hero* was prettily enunciated by Miss Oliver;—that of *Dogberry* humorously sustained by Mr. Compton; and, altogether, the performance of the drama was in good taste, and, as an intellectual amusement, far above the common average of theatrical excellence.

ADELPHI.—Mr. T. P. Cooke has accepted a short engagement at this theatre, and on Monday appeared as *William* in 'Black-eyed Susan.' His performance of *Long Tom Coffin* is also announced.

STRAND.—The most severe criticism yet written on the 'Traviata' is that implied in the burlesque of the opera by Mr. L. Buckingham, produced on Monday with success at this theatre. The dark arches of the Adelphi supply him with his characters, or caricatures; and the breadth of the allusions in the parodies and songs has scarcely a parallel even in the most extravagant of similar free-and-easy compositions. The fun is fast and

furious, the mirth uproarious, the action perfectly ridiculous, and the acting guilty of every absurdity that burlesque performers, intent only on sport, can perpetrate. The spirit of all this, moreover, was concentrated in a few remarks on the face of the play-bill,—but here, we understand, the Lord Chamberlain has interfered, and the offending paragraphs have been cancelled. But the unrestrained satire on fashionable sentimentality remains in unmitigated force in the text of the burlesque itself. We wish the talents of the author had found a less dangerous theme.

MUSICAL AND DRAMATIC GOSSIP.—To-night Sadler's Wells Theatre opens under the management of Mr. Phelps, for the usual dramatic season.

The bronze medals for presentation to the performers at the commemorative Festival in honour of Handel, given at the Crystal Palace, are now in course of distribution. The medal is rather trumpery,—the profile of Handel is bold; but the insertion of the name Handel in the side space spoils whatever beauty the front face of the medal would otherwise possess. The obverse—a classical harp—is barren in idea and weak in execution. Altogether, the Handel medal is in the style of those three-sou memorials sold on the Boulevards and at the gates of *Père la Chaise*.

The Weimar Jubilee has gone by, as everything, good or bad, will go by, and the German papers are full of reports of the three festive days which, on the whole, seem to have given universal satisfaction. Let us never leave off celebrating the memory of the truly great in a worthy manner, if it be merely to turn the mind from every day's sordid care and drudgery, and to wake it, though only for moments, to the "passion du sublime!" On the 2nd of September, being the eve of the jubilee, Goethe's *'Iphigenie auf Tauris'* was represented on the grand Ducal Theatre, but the performance was indifferent. On the 3rd, as early as five o'clock in the morning, the little pleasant town of Weimar was awakened by the ringing of all the bells, and began even at that early hour to put on its festive looks. A grave act of piety commenced the day; a large number of people, not to forget the maidens dressed in white, moved in formal procession to the cemetery, where in one vault rests Karl August and his two poet-friends. Here a profusion of garlands and wreaths were laid down on the coffins by pious hands, and the vault remained open to the public for a couple of hours. After divine service, the bells rang again for the laying of the foundation-stone to the monument of Karl August, on the *Fürstenplatz*. An elegant crowd, and the Court with many royal visitors, were assembled. The square was tastefully decorated, and the festive procession—with the gay banners and emblems of the City Corporations, with the Jena Professors in their old-fashioned official gowns, and the students in the picturesque costume of the different "Landsmannschaften"—was particularly interesting. The ceremony went off with the usual speeches and songs, and even the customary sunbeam, after a dull morning, was not wanting at the principal moment. The afternoon turned out bright and sunny; it was devoted by the numerous strangers to the visiting of Goethe's and Schiller's rooms (open to the public on the three days), and of the "Roman house" in the park, once the favourite spot of Karl August. Less sublime enjoyments were arranged for the "million," who in the archery grounds near the park might indulge in national games, puppet-shows, &c., as much as they chose. In the evening the theatre was the principal attraction. Dr. Franz Dingelstedt's *Festspiel*, "Der Erntekranz" (the Harvest Home), was first represented—a little masterpiece in its genre, it is asserted, much to the purpose, and written in fine and elegant language. Emperor Frederick Barbarossa, the hero of so many a fine Thuringian legend, (whose long nap in the *Kyffhäuser*, we are sorry to say, is but too often disturbed by those intrusive meddlers the German poets,) and "Frau Holle," also a popular figure in German folk-lore, acted the principal parts in the play, at the end of which the author was called. After this, Goethe's *'Palaeophron und Neoterpe'* was given; and the third act of Schiller's *'Don*

Carlos' closed the evening. Herren Dawison and Emil Devrient were rewarded by vivid applause. On the 4th of September the unveiling of Wieland's, as well as of Goethe's and Schiller's, monument took place. The procession, as on the previous day, moved at ten o'clock to the "Wielandsplatz," where again the Court was assembled. After an appropriate speech made by Hofrath Schöll, the covering fell, and loud cheers saluted the Author of *'Oberon'*, who stood before the crowd in a naturally graceful attitude, the head a little raised, the right hand extended, and the left resting on a book that is placed on the trunk of a tree behind him. The monument, a work of Herr Gasser, at Vienna, the same master to whom Weimar is indebted for Herder's statue, does the artist credit. From the "Wielandsplatz" the procession moved to the "Theaterplatz," in the centre of which the Goethe and Schiller group, by the hands of Prof. Rietschel, rises on a pedestal of granite. Tribunes were erected for the Court and other distinguished spectators; all the windows and roofs of the surrounding houses were crowded, and the scene altogether presented a lively aspect. Herr Schöll again addressed the public with great animation; the way in which he was several times interrupted by the cheers of the enthusiastic multitude shows how the love and veneration for the two great poets has become a sort of "hero-worship" in almost every German heart. Weimar possesses a work of Art in this monument of which it may justly be proud. At the left of the spectator Goethe (in dress-coat) stands in a firm attitude, looking at the world frankly, gravely, and self-composedly. His right hand holds the laurel-crown, his left rests on the shoulder of Schiller, who (in frockcoat, and his shirt-collars turned down), has raised his look to the heavens, his home, the realm of his ideals, while his right hand touches the wreath which Goethe holds; his left arm hangs down, holding a paper. His graceful attitude has something light, soaring, as if he did not quite belong to the earth. Both heads are very expressive, individually characteristic, and beautifully conceived. When the artist, Prof. Rietschel, was summoned to the tribune of the Court to receive the thanks of the Art-loving grandson of Karl August, loud cheers from the admiring crowd followed him. The execution of Mendelssohn's Chorus: "An die Künstler," concluded the ceremony. Beautiful hands then covered the statues of the poet-friends with flowers and laurel-wreaths, so that soon the pedestal was changed into a bright flower-bed. The day ended with a representation in the theatre, the *répertoire* of which was composed of the second act of *'Torquato Tasso'*, the first act of *'Götz von Berlichingen'*, the third act of *'Egmont'*, the fourth act of *'Wallenstein's Tod'*, the fourth act of *'Faust'*, and lastly, Schiller's *'Song of the Bell'*, represented in *tableaux vivants*. Some of the most distinguished actors, Herren Devrient and Dawison, Fräulein Marie Seebach and Fräulein Fuhr, lent their aid to the celebration of these days gratuitously.

TWENTY-SEVENTH MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

SATURDAY.

SECTION A.—MATHEMATICAL AND PHYSICAL SCIENCE.

'On some Phenomena in Connexion with Molten Substances,' by Mr. J. NASHMYTH.—The author stated, on introducing the above subject to the notice of the Section, that his object in so doing was to direct the attention of scientific men to a class of phenomena which although in their main features might be familiar to practical men, yet appeared to have escaped the attention of those who were more engaged in scientific research. The great fact which he desired to call attention to is comprised in the following general proposition,—namely, that all substances in a molten condition are specifically heavier than the same substance in an unmolten state. Hitherto water has been supposed to be a singular and special exception to the ordinary law,—namely, that as substances were elevated in temperature they became specifically

lighter, that is to say, water at temperature 32° on being heated does on its progress towards temperature 40° become more dense and specifically heavier until it reaches 40°, after which, if we continue to elevate the temperature, its density progressively decreases. From the facts which Mr. Nasmyth brought forward, it appears that water is not a special and singular exception in this respect, but that, on the contrary, the phenomenon in relation to change of density (when near the point of solidification) is shared with every substance with which we are at all familiar in a molten state, so entirely so, that Mr. Nasmyth felt himself warranted in propounding, as a general law, the one before stated,—namely, that in every instance in which he has tested its existence he finds that a molten substance is more dense, or specifically heavier, than the same substance in its unmolten state. It is on account of this that if we throw a piece of solid lead into a pot of melted lead, the solid, or unmolten metal, will float in the fluid, or molten metal. Mr. Nasmyth stated, that he found that this fact of the floating of the unmolten substance in the molten holds true with every substance on which he has tested the existence of the phenomenon in question. As, for instance, in the case of lead, silver, copper, iron, zinc, tin, antimony, bismuth, glass, pitch, rosin, wax, tallow, &c.; and that the same is the case with respect to alloys of metals and mixtures of any of the above-named substances. Also, that the normal condition as to density is resumed in most substances a little on the molten side of solidification, and in a few cases the resumption of the normal condition occurs during the act of solidification. He also stated that, from experiments which he had made, he had reason to believe that by heating molten metals up to a temperature far beyond their melting point, the point of maximum density was, as in the case of water, at 40° about to be passed; and that at such very elevated temperatures the normal state, as regards reduction of density by increase of temperature, was also resumed, but that as yet he has not been able to test this point with such certainty as to warrant him to allude further to its existence. Mr. Nasmyth concluded his observations by stating, that he considered this to be a subject well worthy of the attention of geologists, who might find in it a key to the explanation of many eruptive or upheaving phenomena which the earth's crust, and especially that of the moon, present,—namely, that on the approach to the point of solidification molten mineral substances then beneath the solid crust of the earth must, in accordance with the above-stated law, expand, and tend to elevate or burst up the solid crust,—and also express upwards, through the so cracked surface, streams more or less fluid of those mineral substances which we know must have been originally in a molten condition. Mr. Nasmyth stated, that the aspect of the lunar surface, as revealed to us by powerful telescopes, appeared to him to yield most striking confirmation of the above remark. He concluded by expressing a hope, that the facts which he had brought forward might receive the careful attention of scientific men, which their important bearing on the phenomena in question appeared to him to entitle them to.

A Gentleman in the Section asked Mr. Nasmyth whether the facts well known to chemists, that cast iron, and one or two other metals, in the act of solidifying enlarged so as to fill out sharply the minute parts of the mould—which was indeed the property on which their great use chiefly depended—were not at variance with his general principle.—Mr. NASHMYTH replied, that so far from that, they were the most striking examples of its application.

'On some Application of Quaternions to Cones of the Third Degree,' by Sir W. R. HAMILTON.—It would be impossible to give the general reader any clear idea of this very abstruse paper; but at its conclusion the soundness of the principles on which the author proceeded was made strikingly manifest to the Section by Mr. H. J. Smith, of Oxford, explaining in fully as lucid a manner as that of Sir W. Hamilton (who makes every one that hears him for the moment think that he clearly comprehends the whole subject) how by the method

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of quaternions, but by a different process from that of Sir W. Hamilton, he had in some of the examples selected by Sir W. Hamilton arrived at precisely the same numerical results.

'On the Distribution of the Orbits of the Comets in Space,' by Cavaliere O. F. MOSSETTI.—The author not being present, this communication was read and explained by Prof. BOLZANI.—The author commenced by explaining that the simplest and most direct method of analyzing the distribution of the comets in space would seem to be, to divide the celestial sphere by means of so many circles parallel to the ecliptic into equal zones corresponding to an aliquot part of the entire superficies, and then to ascertain how many culminating points are contained in each of these. If the orbits were uniformly distributed throughout space, each of them should contain about an equal number of these points; if not, the greater or less number contained in each will serve to show the tendency the orbits have to approach to or recede from that distribution. The author applied this method arithmetically in the first instance; and afterwards, in order to render the results more palpable, reduced them to a graphic construction.—The learned Professor then exhibited and explained to the Section, in detail, the several formulae on which the numerical examination of the question was founded, and then exhibited and explained the graphic construction reduced to a planisphere. The same planisphere, when properly projected, was made to serve for both the Northern and Southern hemispheres, by colouring the projecting lines which marked radially on the outer circle the longitudes of the culminating points and of the parhelia for the Northern hemisphere blue, and for the Southern black, and on each of these radial lines was marked the number assigned to the comet in the catalogue of the 263 discussed by the author. If, then, we conceive these two lines to be produced to the centre, and caused to revolve towards the Northern hemisphere if marked with the sign plus, to the Southern if marked minus, until they take the position of the inclination of the orbit marked as belonging to each, the position of the two lines will present to the mind a picture of the position which the orbit will hold as well in space as in its own plane. At the end of each of the eight tables, corresponding to the eight zones, were specified the total number of orbits found in that zone, as well as the number of those having their parhelia in the Northern or Southern hemisphere, and their motion direct or retrograde; combining the data thence given, the author drew up the summary of the whole. He found the orbits to have a tendency to approach in prevailing numbers the polar regions of the ecliptic. The minimum occurs in the fifth zone of each hemisphere. Those whose parhelia are in the Northern hemisphere exceed those whose parhelia are in the Southern in the proportion of 3 to 2. The number of those having a direct motion to those retrograde as 5 to 6, or nearly equal. The author calls the Great Circle, which passes so as to divide the Milky Way pretty equally, the Galaxy Circle. In the centre of this the Sun and Earth may be considered to be placed; it cuts the ecliptic towards the solstitial points, and is inclined to it at about 60° . He then finds that the planes of the orbits of the comets are, for the most part, little, if at all, inclined to the plane of the Galaxy Circle, and that they go on decreasing in number as that inclination increases; and, therefore, he concludes that some cosmical cause must have led to such a result. Also, the parhelia of by far the greater number of those he has discussed are found near the Galaxy Circle, showing that when they are passing most closely under the influence of the Sun they are both near the Galaxy Circle, and their proper motion is nearly parallel to its plane. Hence the greater number of comets come to us from the region of the Galaxy itself.

'On the Direction of Gravity at the Earth's Surface,' by Prof. HENNESSY.—If the earth's surface be considered to coincide with that of the liquid which covers three-fourths of the entire spheroid, gravity should be considered as perpendicular to it at every point. If, however, the earth were stripped of all its seas and oceans, the

surface would present considerable inequalities. From what is now known regarding the depth of the ocean, the continents would appear as plateaus elevated above the oceanic depressions to an amount which, although small compared to the earth's radius, would be considerable when compared to its outswelling at the equator, and its flattening towards the poles. The surface thus presented would be the true surface of the earth, and would not be perpendicular to gravity. If a kind of mean surface be conceived intersecting this, so as to leave equal volumes above of elevations, and of depressions below it, it is not allowable to assume that such a surface is perpendicular to gravity. The mean surface of the solid crust of the earth would not be perpendicular to gravity, if, after the process of solidification had commenced, any extensive changes in the distribution of matter in the earth's interior could take place. If the fluid matter in solidifying underwent no change of volume, the forms of the strata of equal density within the earth would be the same at every stage of its solidification. But if, as observation indicates, such fused matter, on passing to the solid crystalline state, should diminish in volume, the pressure on the remaining strata of the fluid would be relieved, and they would tend to assume a greater ellipticity than they had when existing under a greater pressure. The general result of this action would manifestly be to produce a change in the direction of the attractive forces at the outer surface of the solid crust. The direction of a plumb-line would be slightly altered so as to slightly increase the apparent latitudes of places over a zone intermediate between the equator and poles.—M. D'ABBADIE stated several cases which he had met with, where monuments existed which showed that the direction of gravity at some former period must have been very different in relation to those particular portions of the earth from what it now was.—Other Members also noticed deviations of the plumb-line from its normal position, and some of them which seemed to depend on the season of the year.—The President, Dr. ROBINSON, stated that he was the first to direct attention to those changes of level which depended on the season of the year. This he had to observe from the fact, that the entire mass of rock and hill on which the Armagh Observatory was erected was found to be slightly, but to an astronomer quite perceptibly, tilted or canted at one season to the east, at another to the west. This he had at first attributed to the varying power of the sun's radiation to heat and expand the rock throughout the year; but he since had reason to attribute it rather to the infiltration of water to the parts where the clay, slate, and limestone rocks met in their geological arrangement. The varying quantity of this through the year he now believed exercised a powerful hydrostatic energia, by which the position of the rock was slightly varied.

'On some General Propositions connected with the Theory of Attractions,' by the Rev. Prof. JELLET.—He showed that the attraction of a body whose particles act with a force varying inversely, as any odd power of the distance, may be easily deduced from that of a body having the same form and quantity of matter, the law of attraction being the inverse first power of the distance. He showed further that, while a knowledge of the attraction of a body whose particles act according to the law of nature, that is to say, the inverse square of the distance, gives us no information as to any other law (at least in this method), the knowledge of the attraction for the inverse fourth power gives it for every higher inverse power. From these theorems he proved that there is no law of force capable of being represented by a series of inverse powers of the distance, except the law of Nature, for which a body will attract as if its mass were concentrated at a fixed point. He showed also that there is no law of force capable of being represented by a finite series of inverse powers of the distance, except the law of Nature, for which a shell of any form will exercise no attraction on a point within it. If, then, the particles of the electrical fluid acted on each other according to any such law, except that of Nature, free electricity, instead of residing, as it does, entirely on the surface, would be dispersed

through the entire of the charged body. These theorems have been hitherto (so far as the author is aware) known only for a spherical surface. After alluding to a well-known theorem of Chasles, he stated, as a generalization, that if any two bodies have one external equilibrium surface common, their attractions at any point of external space will be in the same direction and proportional to the masses of the bodies, the law of force being that of Nature.

'On a Telescope Speculum of Silvered Glass,' by M. LÉON FOUCALUT.—The astronomical refractor compared with the reflecting telescope of the same dimensions, has always had the advantage of giving more light; the pencil of rays which fall on the object-glass pass through it for the most part, and are employed almost entirely in the formation of the image at the focus; while, on the metal mirror a part only of the light is reflected in a converging pencil, which loses still more by a second reflexion being brought back towards the observer. However, as the reflecting telescope is essentially free from aberration of refrangibility, as the purity of its images depends only on the perfection of a single surface, as with regard to focal length it possesses a greater diameter than the refracting telescope, and thus partly regains the light wasted by reflexions—some observers continue to give it the preference, chiefly in England, over the refracting telescope for the examination of celestial objects. It is certain that at this moment, and despite the multiplied improvements in the manufacture of large glasses, the most powerful instrument directed towards the heavens is a telescope with a metal speculum. The telescope of Lord Rosse is six feet English in diameter, and its focal distance is fifty-five feet. Possibly the reflecting instruments would have gained the superiority could the metal take as durable a polish—could it be as well worked as the glass, and were it not heavier. Placing thus in parallelism the two sorts of instruments, and discussing their respective qualities and defects, I finished by conceiving that the telescope with a glass would possess every advantage, if the mirror being once shaped and polished we could communicate to it the metallic brilliancy, in order to obtain from it images as luminous as those of the refracting telescopes. This thought, which at first appeared a fiction of imagination, was soon converted into satisfactory reality. The glass being cut by an experienced optician, and thoroughly polished, is ready to be covered by Drayton's process with a very thin uniform coating of silver. This metallic coating, which when taken out of the bath in which it is formed dull and dark, is easily brightened by rubbing with a skin lightly tinged with oxide of iron, and acquires in a short time a very brilliant lustre. By this operation the surface of the glass is wholly of metal, and becomes vividly reflective, not exhibiting under severest tests the slightest alteration in form. To procure a disc of glass with concave surface perfectly finished, I applied to Mr. Secretan, who had the kindness to provide for me a clever workman. On the other hand, to be able to obtain a deposit of silver, I had recourse to the owners of the English patent, M. Power and M. Robert, who actually work the process in France, and who furnished me with the silvery solution, giving at the same time the fullest instructions as to how I might soonest succeed. My mirror being silvered, and having acquired a polish of steel, I formed a telescope of it of ten centimetres diameter and fifty centimetres focal length. This little instrument supports well the eye-glass, which magnifies 200 times, and compared with the reflecting telescope of one metre, gives very sensibly superior effect. Wishing to learn the proportion of light usefully reflected by the layer of silver deposited on the glass, and afterwards polished, or, at least, to compare the intensity of a pencil of rays reflected by a surface thus prepared with that of one transmitted by an equal surface from the object-glass of a refracting telescope, I accomplished the matter without difficulty by means of a photometer with divisons, which I had employed on another occasion. The result of this operation insures a decided advantage to the new telescope. The pencil of rays reflected on the silvered glass is equal to 90 per cent. of

those transmitted through an object-glass of four partial reflections; so that the new instrument avails itself of the overplus of light, which, on account of the greater diameter of the mirror, concurs efficiently to the formation of the focal image. Diameters equal, the telescope with glass is by one-half shorter than the other instrument,—with equal lengths, it bears a double diameter, and collects three and a half times more light. Considered in another point of view, the new combination is distinguished in this, that it produces all its effect without the concurrence of those numerous conditions required to obtain a certain degree of perfection in any instrument, whether reflecting or refracting telescope. The reflecting telescope, above all, requires that the constructor of it, at one and the same time, pay particular attention to the homogeneity of the two sorts of glass which form the object-glass, their refracting and dispersive powers, the combination of curves, the centerage and the execution of four spherical surfaces. In the new telescope, on the contrary, the glass serving not as a middle refractor, but only to support a very thin layer of metal, the homogeneity of the mass is by no means required, and the most ordinary glass of sufficient thickness worked with care affords a concave surface, which when silvered and polished furnishes of itself and by reflexion excellent images. There is one strong objection to the metal mirrors,—it is, that they become oxidized in time, and are tarnished by contact with the air. Eight months I have silvered mirrors, which have not yet undergone any sensible alteration. Will they preserve this state of perfection a still longer time? The experiment has not been sufficiently prolonged to decide one way or the other; but even should the lustre of the mirror become weaker, there is no difficulty in recurring to the same means for re-establishing it, by which it had been at first obtained. In fine, should the depth of the silver be altered, the operation of depositing it is so easy and prompt, that it can easily be repeated. To resume, the new instrument compared with the reflecting telescopes gives, at much less cost, more light, more distinctness, and is free, like the reflecting telescope, from all aberration of refrangibility.

Prof. STONEY asked what the material of the polisher used by M. Foucault was, and gave various reasons for doubting that the method proposed by the author would ever produce a speculum the defining power of which could approach to that of specula ground and polished by the methods devised and executed by Lord Rosse.—Mr. GRUBB stated, that if the $\frac{3}{500}$ th of an inch spoken of by M. Foucault was meant to convey an idea that that dimension bore any relation to the quantity removed in the process of polishing, his own experience would enable him confidently to deny its power of producing a speculum of accurate defining power, as in the polishing process thicknesses of a 40 and 50 thousandth part of an inch became important thicknesses.—The President, Dr. RONINSON, said, that when M. Foucault had visited Lord Rosse, as he was about to do, and had seen the apparatus which he used for grinding and polishing even monster specula, he would not, he felt well assured, consider these operations on metals so formidable as they now appeared to him; he would find that to polish the great speculum of six feet diameter, in which operation it was brought to the true figure for best definition, occupied only a matter of about five hours from the time it was placed upon the machine. As he knew that Mr. Grubb had much experience in the details of the processes of grinding and polishing specula and lenses, he begged to suggest to that gentleman to favour the Section with the results of that experience on a future day in a communication.—Mr. GRUBB assented.

‘On the Correlation between Dynamical Electricity and other Physical Forces,’ by M. LOUIS SORÉT.—The author, not being in the Section, his communication was read and explained by Prof. THOMSON, who characterized the Essay as highly valuable as being a good résumé of Faraday’s original discovery on the subject, and as having worked out well and laboriously some of the principal details, and apparently with great numerical accuracy.

‘On Certain Properties of the Radii of Curvature of Curves and Surfaces, and their Application to the Method of Polar Reciprocal,’ by Mr. T. MARTIN.—The author explained by diagrams and formulæ the method of considering curves and their reciprocals which he was led to, and then by several well-selected examples from elementary conic sections showed the rapidity and certainty of the conclusions drawn by the method, and then pointed out some of its more advanced applications.

‘A Demonstration that the Three Angles of every Triangle are equal to Two Right Angles,’ by Mr. B. A. MURRAY.—The author in a well-arranged series of theorems and lemmas, which we have no doubt he will publish in *extenso* in some mathematical journal, arrived at his conclusion, the first case being that of a triangle in which one angle is right. Several of the mathematicians of the Section, including one or two of the Fellows of Trinity College, caused the author to go deliberately over each step, and then stated that they could not, as far as they then saw, find any flaw in the demonstration given by the author.

MONDAY.

‘On the Amount and Frequency of the Magnetic Disturbances and of the Aurora at Point Barrow, on the Shores of the Polar Sea,’ by Major-General SABINE.—Point Barrow is the most northern cape of that part of the American continent which lies between Behring’s Strait and the Mackenzie River. It was the station of H.M.S. *Plover* from the summer of 1852 to the summer of 1854, and to the Captain, Maguire, now in the Section, and officers of that ship, they were indebted for the very valuable series of observations which he was now about to lay before the Section, and in part discuss. They were furnished with supplies of provisions, &c., for Sir John Franklin’s ships, had they succeeded in making their way through the landlocked and ice-encumbered channel, through which they sought to effect a passage from the Atlantic to the Pacific. In this most dreary and otherwise uninteresting abode Capt. Maguire and his officers happily found occupation during seventeen months, unremittingly, in observing and recording every hour the variations of the magnetic and concomitant natural phenomena, in a locality perhaps one of the most important on the globe for such investigations. Their observatory, placed on the sand of the shore, which for a long tract nowhere rose much above five feet above the sea, was constructed of slabs of ice, and lined with seal-skins throughout. The instruments had been supplied by the Woolwich establishment, with the requisite instructions for their use; and the observations were made and recorded precisely in the same manner as those of the Colonial magnetic observatories. These were sent by Captain Maguire to the Admiralty, and were in due course transmitted to General Sabine, by whom they were subjected to the same processes of reduction as those made in the Colonial observatories. The author then exhibited to the Section six long rolls, containing the results of this discussion, giving the reduced observations at each of the hours of the twenty-four. A sufficient body of the larger disturbances having been separated from the rest, it was found at Point Barrow as elsewhere, wherever similar investigations had been made, that in regard to the frequency of their occurrence, and the average amounts of easterly and westerly deflections, the disturbances followed systematic laws depending on the hours of solar time. The laws of the easterly and westerly were also found at Point Barrow, as elsewhere, to be distinct and dissimilar. The author explained how these observations, which manifestly related to those arising from what were called ‘storm,’ were separated from the rest; and when that separation was effected, the law of the true solar variation was shown distinctly to be observed. But upon instituting a comparison between the disturbance laws at Point Barrow and Toronto, it was found that the laws of the deflections of the same name at the two stations did not correspond; but, on the other hand, there existed a very striking and remarkable correspondence between the law observed by the easterly at Point Barrow and the westerly at Toronto, and between the law of the westerly at Point Barrow and easterly at Toronto;

and this correspondence was shown to exist not in slight or occasional particulars only, but throughout all the hours in well-marked characteristics of both classes of phenomena: and it follows from the correspondence in the hours at which opposite disturbance deflections prevail, that the portion of the diurnal variation which depends upon the disturbances has opposite, or nearly opposite, characteristics at the two stations. The importance of eliminating these disturbances from the regular march of the solar variation was then pointed out in both: for when the diurnal variation is derived from the whole body of observations at Point Barrow, retaining the disturbances, the westerly extreme of the diurnal excursion, which, as is well known, occurs generally in the extra-tropical part of the northern hemisphere a little after 1 P.M., is found to take place at 11 P.M.; but when these larger disturbances are omitted, the westerly extreme falls at the same time as elsewhere—viz., 1 P.M.; and the author suggested the probability that the anomalies which have sometimes been supposed to exist in the turning hours of the solar diurnal variation in high latitudes may be susceptible of a similar explanation. It appears, then, by a comparison of the Point Barrow and Toronto observations, that in the regular solar diurnal variation the progression at the two stations is similar, the easterly and the westerly extremes being each reached nearly at the same hours, whilst in the disturbance diurnal variation this progression is reversed. Another distinction exists in their magnitudes, which is found in the solar diurnal variation to be as nearly as may be in the inverse ratio of the values of the horizontal force at the two stations, (which is the antagonistic force opposing all magnetic variations,) whilst on the other hand the increase in the range of the disturbance variation is many times greater than it would be according to the same proportion. It would appear, therefore, that the absolute disturbing force must be much greater at Point Barrow than at Toronto. The author then proceeded to point out the concomitant occurrences of the auroral manifestations. The observers noted at each hour whether or not there was an auroral display: from 11 A.M. to 3 P.M. no auroral displays were ever observed; but the number of them was found progressively to increase from 3 P.M. to 1 A.M., and then again in regular progression to decrease to 0, at 11 A.M. The frequency of the occurrence of the aurora may be judged of, when it is said that during six months,—December, January, and February of 1852-53, and the same of 1853-54,—the aurora was seen six days out of every seven. The hour of the day at which no auroral display is ever observed corresponds with the minimum of westerly disturbance, while the maximum of both is found at the same hour of westerly disturbance—viz., 1 A.M. The frequency of the aurora, also, and the amount of westerly deflection of the magnet also accord; whilst on the other hand the auroral hours appear to have little or nothing in common with the turning hours or the progression of the easterly deflections. When Sir John Franklin was going out on the expedition which deprived his country of the invaluable services of himself and his brave companions, he had been furnished by the Admiralty both with instruments carefully adjusted and compared with standards and with full instructions for their use, and for the making and recording hourly observations of the utmost importance in the several stations he might occupy in these seas; and in the last letter which had ever been received from him, he had expressed his determination to put up those instruments at the several stations at which he should winter. Now when his ardour in these pursuits and that of Capt. Crozier, the second in command, and the other officers, were taken into account, there could remain no doubt that such observations had been made and recorded, and that these records still existed in some of the places he had last been in. When he (General Sabine) was with Capt. Parry, in 1818, they had made observations with the pendulum for determining the figure of the earth, and others of great scientific importance, on their way towards Behring’s Straits. They had been exposed to considerable risk of the ships being lost, and were about to take to the

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boats and proceed overland, and in preparation for this merely prepared to carry with them abstracts of the observations, leaving the original full records safely deposited in secure cases in the cabins of the ships, to be found by those who doubtless would be sent out to look for them. He had, therefore, no doubt that if the ships of Sir John Franklin were still in existence, in their cabins were to be found those scientific treasures; and this was one of the reasons why men of science were so anxious to have the ships carefully looked for, and it was a sacred duty even to the memories of those who had sacrificed their lives in procuring such results to do them the justice and honour of having them recovered if possible.

At the conclusion of General Sabine's address, the PRESIDENT requested Capt. Maguire to favour the Section with a portion of what he had observed in these most inhospitable, but to the scientific inquirer deeply interesting regions.—Capt. MAGUIRE, with that modesty which is so characteristic of the British sailor, disclaimed for himself much merit, and assigned all the praise of making and recording these hourly observations, through such a very lengthened period, to his brother officers, he himself only occasionally helping, particularly when he was out with exploring parties. He said he much wished he could convey to the Section any vivid impression of the beauty and brilliancy of the auroral displays in those regions. It was never seen during the hours of daylight, or those hours which corresponded to mid-day, but towards evening its displays began, at first towards the north; it then extended in splendid arches spanning the entire sky, and seeming to end in beautiful coronae towards the zenith; these were occasionally of the most brilliant and varied tints and colours. It spread gradually more south, and at length died away towards the morning hours in the south. Such were the beauty and interest of these displays, that men and officers constantly, with the thermometer at and below 40° below zero, stood out for hours witnessing the glorious scene. During these auroral displays he could not say that he had ever witnessed those violent agitations of the needle that others had described, but the easterly disturbance of the variation seemed to be simultaneous with its northerly display, and the westerly to its influence when it had passed to the south. At some distance from the ships, say about five miles, the water shoaled, and the ice had been driven up into beautiful rocky pinnacles; beyond this, again, the water was always free of ice, and its temperature was frequently found to be 25° above zero, when that of the air above was even 40° below zero; the consequence was, that it had all the appearance of a boiling sea, so great was the quantity of vapour thrown up from it.—Admiral FITZROY, Mr. GASSIOT, and other members of the Section, spoke of the most important interest which these inquiries had in a scientific point of view, and could not help thinking that if the Admiralty had been more strongly pressed upon the subject, they would not have persevered in declining to aid in the expedition which had gone out this year.

'On the Temperature of the Air registered at the Plover's Winter-quarters at Point Barrow, in the Years 1852-3-4,' by Dr. JOHN SIMPSON.—This communication was brought under the notice of the Section by Prof. Haughton. The author commenced by saying that his attention was first directed to the importance of this subject, and he was induced to undertake the laborious task of hourly observations on the temperature in these regions, by certain remarks of Sir J. Richardson, at p. 331 of the ninth volume of the 'Royal Geographical Society's Journal,' 1839, in reference to Sir D. Brewster's discussions of the hourly register of the temperature at Leith Fort. The author then stated that the observations had been continued from the 3rd of September, 1852, to the 7th of August, 1853, and for a few days before and after each of these dates in the neighbourhood, making a complete year, less 21 days. Again, in precisely the same locality, from the 7th of September, 1853, to the 19th of July, 1854, to which have been added the first six days of September and one day, the 21st of July, during which the ship was in the immediate neighbourhood, making a second

complete year, less 42 days. The ship returned to the same spot on the 27th of August, 1854, and remained four whole days, for which the hourly register gave a mean temperature of $39^{\circ} 448$, serving as a fair guide for estimating the temperature of the last eleven days of August. He then touched on the principle of an estimate for filling up the entire interval of twenty-one days in 1853, and proceeded to describe the instruments used, which were furnished by Adie & Co., of Edinburgh, and which, having been returned to the Hydrographer's office in 1855, could now be re-examined and compared with standards at Kew. The author then proceeded to give some highly interesting details of the freezing of the mercurial thermometers, and of the freezing of mercury exposed in open vessels; the temperature when it froze seemed about 39° . Prof. Haughton then proceeded to direct the attention of the Section to several interesting points selected from the Journal and tables, and concluded by describing two large sheets of curves of mean temperature: Fig. 1 showing the mean daily curve of temperature in the shade for each month of the year; also the mean daily curve of temperature in the sun for the month of June. Fig. 2 showed the mean daily curve of temperature for each season of the year, for the summer and winter half-years, and for the whole year; also the mean daily curve of temperature in the sun for forty-two days at Midsummer. The latitude of Point Barrow is $71^{\circ} 21'$ north, longitude $156^{\circ} 17'$ west.

'Report of the Committee on the Magnetic Survey of Great Britain,' by Major-Gen. SABINE;—who began by a brief review of the important researches connected with the magnetism of the globe by Prof. Bache and others in America; by our own observers at several stations over the various parts of the earth; and on the Continent of Europe by several eminent persons whose names he mentioned. In connexion with them it was deemed advisable to re-examine the magnetism of the several parts of the British Islands, and a Committee had been formed who had divided them into five sections. South Britain had been entrusted to Sir James Ross, Mr. Phillips, Mr. Fox, and General Sabine; Ireland to Dr. Lloyd; and Mr. Walsh was at this moment in Scotland proceeding with the part entrusted to him. The present was to be considered as merely a provisional Report, to show that the Committee had made some progress. It was intended that the details of their work should be laid before the Association at its next meeting, in 1858, and he had little doubt that valuable as well as highly interesting results would be brought before the Section at its meeting next year.

'Register of Periodical Phenomena at South Lincolnshire,' and 'Register of Periodical Phenomena at Llangelech, Glamorganshire.'—The PRESIDENT stated that these registers, though possessing some interest to the meteorologist, were chiefly drawn up as exemplifications of the use of tables drawn up under the superintendence of a committee appointed by Section D, and chiefly for their use, and therefore they had been handed over to them.

'Notice of Meteorological Observations made at Sea,' communicated by Admiral FITZROY.—Admiral FitzRoy drew the attention of the Section to the meteorological papers lying on the table, which had been recently published by the Board of Trade. The Report to which he referred would show what progress had been made, and therefore he would not occupy valuable time by entering into details. He would only observe generally, that a great number of valuable observations had already been made on board some hundred ships, with excellent instruments approved by the Kew Committee of the British Association, and that those observations were regularly tabulated in such a manner as to admit of their being combined in groups or used individually. The willing co-operation of officers at sea had already accumulated more observations than can be reduced and tabulated with corresponding quickness; therefore more reduction of observations rather than more observers with a larger number of instruments, seems necessary; and this can only be accomplished by employing a larger staff. The Government had shown the utmost willingness to attend to the

recommendations of competent authorities with respect to the establishment and support of the Meteorological Office at the Board of Trade; and only desired to apply the vote sanctioned by Parliament for meteorological observations at sea to the best possible advantage. The United States, Great Britain, and Holland, had already co-operated largely in this work, and France had lately established a similar department for collecting and discussing such observations.

Exhibition of Mr. Wildman Whitehouse's Relay and Induction Coils in Action on Short Circuits, by Prof. W. THOMPSON.

'On the Effects of Induction in long Submarine Lines of Telegraph,' by Prof. W. THOMPSON.

'Meteorological Phenomena at Huggate, Yorkshire,' by the Rev. T. RANKIN.—This was a continuation for the year 1856-7, of those meteorological observations which the author has furnished yearly for several years.

'On Vertical Movements in the Atmosphere,' by Prof. HENNESSY.

Examination of some Problems in Meteorology, and a new and complete explanation of the Rainbow, by M. F. RAILLARD, communicated by the ABBÉ MOIGNO.

'On the Distribution of Heat over the Surface of the British Isles,' by Prof. HENNESSY.—Since the author had communicated to the Section at the Cheltenham Meeting of the Association an account of his general views as to the laws of distribution of isothermal lines, further confirmation of these views had arisen. It had been already shown that the isotherms in Ireland are partly closed curves surrounding a space of minimum temperature, having its centre a little to the north-east of the centre of the island. With the aid of the observations collected and published by Mr. Glaisher, those contained in Prof. Dove's Reports, and a few additional isolated results, the isotherms for Great Britain have been laid down on the map exhibited to the Section. No correction has been made for elevation above the sea level, as atmospheric phenomena do not depend upon the fictitious temperatures so deduced, but upon its actual amount. This non-reduction would partly account for the remarkable decrease in temperature in going from the coast towards the interior of the island, and by which the space of minimum temperature in Great Britain is made to occupy a position between the midland counties of England and the north of Scotland, where it expands to its greatest breadth. The influence of distance from the sea and of height above it are, doubtless, both combined in producing the remarkable forms of the isotherms of the British Isles, and it would, therefore, be desirable in future tables of the distribution of temperature to have the former element noted in connexion with each station as well as the latter.

SATURDAY.

SECTION B.—CHEMICAL SCIENCE.

'On some Compounds of Cyanogen,' by Dr. ARIJOHN.

'On the Melting Points of Bodies,' by Dr. MALL.

'On the Atomic Weight of Aluminium,' by Prof. MALLETT.—Some experiments were described which the author had made upon metallic aluminium prepared in Paris and in Berlin. The composition of the commercial metal had been found to be

	Paris.	Berlin.
Aluminium	92.960	96.253
Iron	4.882	3.293
Silicon	2.149	454
Sodium	Trace	Trace
Titanium	Trace?	...
	100	100

Dissolving the metal in dilute muriatic acid, precipitating with ammonia, weighing the precipitate, and calculating from the results, and from the above composition of the crude metal, the weight of pure alumina yielded by a given weight of pure aluminium was found, and hence the equivalent of the element. The number deduced from our experiment, out of four made, differed so seriously from that given by the other three, that the investigation must be looked upon as still quite incomplete. The apparent cause of the discrepancy was pointed out

—namely, the retention by alumina of a small amount of water at even a very high temperature. The importance of a speedy revision of the atomic weight of aluminium was insisted upon, the method by which the number now admitted was obtained being noticed as ill suited to give an accurate result.

'Chemical Notes: 1. On Explosive Potassium. 2. On Froth,' by Dr. GLADSTONE.

'On Fused Cast Iron,' by Mr. E. RILEY, of Dowlaus Iron Works.—The author has succeeded in running down with great facility several ounces of best cable bolt iron into buttons, which presented on fracture a beautiful lamellar structure, which worked extremely well at a low heat, but which, after having been exposed to welding heat, was altogether useless, from its property of cracking or crumbling.

'On the Processes for the Detection of Fluorine,' by Prof. G. WILSON.

'On the Composition of Norwegian Apatite,' by Prof. G. VÖELCKER.

MONDAY.

'Supplementary Report on the Process employed in the Preparation of the Flax Plant for textile purposes,' by Prof. HODGES.

'On the Methods of Analyzing the Super-Phosphates,' by Prof. VÖELCKER.

'On the Decomposition by Heat of certain Ammoniacal Salts in Solution,' by Dr. GLADSTONE.

'On some Arseniates of Ammonia,' by Mr. ALPHONSE GAGES.—After mentioning the arseniates of ammonia already described by Berzelius and Mitscherlich, and noticing the doubtful character of the description given in books about the processes for preparing the salts of ammonia and arsenic acid, and the doubtful character of their constitution, he then described his own experiments, in which he verified the constitution of the salts mentioned by Berzelius and Mitscherlich, showing, however, that the salt containing three equivalents of ammonia described by the former, contains seven equivalents of hydrated water. He describes three new double salts, formed by arseniate of ammonia, in which soda, potash, &c. act as the second bases. He also exhibited some beautifully crystallized compounds of arsenic acid, with morphia and quinine, which may probably be of interest as the reagent agents.

'On the Time required by Compounds for Decomposition,' by Dr. WOODS.—The heat absorbed in the decomposing part of the cell was shown in all the instances to be the same in equal times, so that the decomposition, and consequently the intensity of the current, is inversely proportional to the quantity of heat required for the decomposition of an equivalent of the substances used in each case. Other important results, and some predictions which Dr. Woods had already had an opportunity of verifying, were also brought forward in this paper.

'On the Heat of Combination of Acids and Bases,' by Prof. ANDREWS.

'On a new Method of forming Ammonio-Iodides of Metals,' by the Rev. J. B. READE.—It is only within the last few years that the attention of chemists has been directed to the compounds of metals with iodine and ammonia. The 5th edition of Brande's 'Chemistry,' published in 1841, is silent on the subject. At the Oxford Meeting of the British Association, in 1847, I exhibited the ammonio-iodide and per-iodide of gold, and since that time other experiments on other metals have furnished me with results which perhaps may be of some interest to the Chemical Section.

—*Solution of Iodine in Ammonia.* Perhaps the best mode of dissolving iodine in ammonia for the purpose in question, is to place about 50 or 60 grains of iodine in an evaporating dish, hold it over the spirit-lamp till thoroughly warm and the vapour arises, and then add a few drops of Liquor Ammoniae, which will be immediately charged with a large excess of iodine in solution. This may be poured into a bottle, and more iodine and ammonia added, until the requisite supply is obtained.—*Ammonio-iodide of Gold.* Gold-leaf when placed in the iodine solution instantly turns black (a purple if the solution is diluted,) and immedi-

ately dissolves, like sugar in water. If left to evaporate spontaneously in some quantity, we obtain black four-sided prisms of the ammonio-per-iodide, which readily dissolve in water; and if a very weak solution be exposed for some months to the direct action of the sun's rays, a slight precipitate appears, and a drop or two of the clear solution furnishes a most striking microscopic object both as to crystalline arrangement and richness of tint when placed in polarized light.—*Ammonio-iodide of Silver.* Gmelin says of the ammonio-iodide of silver, that "unfused iodide of silver absorbs with evolution of heat 3·6 per cent. of ammonia, and forms a white compound, which on exposure to the air gives off ammonia and turns yellow again." The phenomena are far more interesting when silver leaf is added to the ammonia solution of iodine. The metallic silver is dissolved, and when a few drops are placed on a slip of glass beautiful brushes of prismatic crystals shoot out in all directions, which may be mounted as a microscopic object in Canada balsam after the excess of iodine is spontaneously evaporated. Under polarized light the colours of the crystals are brilliant in the extreme.—*Ammonio-iodide of Mercury.* The phenomena in forming this compound are varied and interesting. Mercury is added to the iodine solution, and after the application of heat and the addition of a little water, a few drops on a slip of glass give bundles of permanent prismatic crystals, similar to those of silver, and acted on with the same energy by polarized light. If ammonia be added to these crystals, they are immediately covered with tufts of snowy whiteness, and by degrees they are converted into ruby-coloured hexagonal prisms, which are also permanent.—*Ammonio-iodide of Cobalt.* Brände observes that "no precipitate is produced in solutions of cobalt either by hydroiodic acid, or iodide of potassium, or by iodic acid, or iodate of potassa." I find, however, that cobalt yields to the action of the ammonio-iodide solution after some hours' digestion and a little heat and water. As might be expected, it exhibits very strongly the sympathetic properties of the chloride, for when placed on paper and gently heated it becomes a brilliant green, which of course vanishes as the paper cools.—*Ammonio-iodide of Titanium.* As titanium, which resists every direct method of attack in the laboratory, yields after a period of digestion in the iodine solution, it is probable that other of the scarcer metals, which are with difficulty reduced by the ordinary methods, might be exhibited in the form of ammonio-iodides, and thus throw additional light on their respective equivalents. The crystals of ammonio-iodide of titanium which I have obtained were from a pure specimen of the metal obtained by Mr. Waterhouse, of Halifax, from the slag of the neighbouring iron-furnaces at Low Moor.—*Ammonio-iodide of Aluminium.* In forming this compound I did not, as on other occasions, use the pure metal, but alumina only, precipitated in the usual way. After allowing the alumina to digest for some time in the iodine solution, the whole was boiled in a little water, which dissolved the new compound, and upon evaporation and the proper measure of heat to volatilize the excess of iodine and ammonia, a white semi-metallic substance remained, as in the case of silver. It is soluble in dilute hydrochloric acid, and yields a blue precipitate on the addition of yellow prussiate of potash. Whether any use can be made of this process towards obtaining the pure metal is of course a problem for practical men.

'Ozone Observations,' by Prof. W. B. ROGERS.

'On the Presence of Copper in the Tissues of Plants and Animals,' by Dr. ODLING and Dr. DUPRÉ.—The authors had made more than 100 examinations by a great variety of processes, and had recognized the presence of copper in nearly every instance. In several specimens of wheat grain and human viscera the copper had been estimated. From 100 grains of wheat-ash the authors had obtained 251 thousandths of a grain, and from a sheep's liver rather more than one-half a grain of oxide of copper. The process was to precipitate the copper electrolytically on a platinum wire, to dissolve in nitric acid, and to ignite the residue of the evaporated solution.

TUESDAY.

Prof. W. B. ROGERS communicated a paper by Dr. A. A. HAYES, 'On some Modified Results attending the Decomposition of Bituminous Coal.'

'Remarks on the Solubility of Salts at high temperatures, and on the action of Saline Solutions on Silicates under the influence of Heat and Pressure,' by Prof. SULLIVAN.

'On the Condition of the Thames Water, as affected by London Sewage,' by Dr. BARNES and Dr. ODLING.—They said it was now established that the pouring in of the contents of the drains did not affect the water as seriously as had been thought. The organic matter of the Thames was chiefly in a state of vitality, and therefore there was not so much putrefaction as was generally supposed; at high water there was the greatest, and at the ebb tide the least amount of organic matter.

'On the Effects of Alum in Panification,' by Dr. ODLING.

'On Three New Electrotype Processes, with specimens,' by the ABBÉ MOIGNO.—The first of these improved processes consisted in the employment of platina wires instead of copper, and of making a skeleton figure resembling roughly the outline of the cast sought to be obtained, by means of which, according to M. Lenoir's process, busts, statues and groups can be produced in full relief by a single operation. The second of these consisted in M. Oudrey's process for galvanizing or coppering iron and cast iron to any thickness required without the cyanide bath, with remarks upon its employment in commerce and in the navy. The process was not fully communicated, as it is commercially desirable to keep it a secret, but sufficient was communicated to show that the cyanide bath, which is not only expensive but dangerous, can be dispensed with, and the present system, according to which there was a great waste of material, avoided, although the substance that was placed upon the iron to induce the deposit of the copper was not stated. The last branch of the paper treated of M. Christophe and Bouillet's process for strengthening electrotypes, the principle of which was to leave an opening in the back of the thin electrotype obtained by precipitating, and to put into it various little pieces of brass, which, on being melted with an oxy-hydrogen blast, became diffused all over the interior surface of the copper without injuring it in any way, and thereby imparted to it the strength of cast iron.

The ABBÉ MOIGNO presented, in the name of M. Bertsch, 'Microscopic Photographs'; in the name of Mr. Bingham, 'Improved Photographic Copies of Oil Paintings'; and in the name of M. Niepce de St. Victor, 'A perfectly New Method of Exhibiting, by means of Photography, the Phosphorescence and Fluorescence of Bodies.'

'On the Conversion of Paper into Parchment,' by Dr. DAUBENTY.—Dr. Daubenty exhibited some specimens of paper that had been converted into parchment. The discovery, he believed, had originated in the experiments made in connexion with the manufacture of gun-cotton, as it was accidentally discovered when dipping paper into nitric acid that the same effect was not exercised upon it as upon the cotton, but it was rendered tough. The alteration visible in the conversion of common paper into parchment after being dipped into weak sulphuric acid, is believed to be attributable to the substitution of an atom of water for an atom of hydrogen.

'On the Preservation of Albuminized Collodion Plates,' by Mr. SYKES WARD.

'Preliminary Notice of Researches on the Assimilation of Nitrogen by Plants,' by Messrs. LOWER, GILBERT and PUGH.

SATURDAY.
SECTION C.—GEOLOGY.

'On the Discovery of Paradoxides in New England,' by Prof. W. B. ROGERS.—This fossil was discovered in a quarry near Boston, which had been open for thirty years without its being suspected by men of science that the rock was fossiliferous. A specimen which Prof. Rogers had succeeded in tracing to that quarry, had been lying in

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a museum for many years. It had been named *P. Hartmani*, and was supposed to be a foreign specimen. These rocks lie between great ridges of igneous rocks, running along the eastern margin of the State of Massachusetts, and although greatly metamorphosed, they exhibit very good specimens of Trilobites. The Paradoxides is a fossil found in several localities in Europe, and always in the lowest fossiliferous beds. Some specimens from Boston appear to be very similar to *P. spinosus* of Barrande, which species is abundantly found in all the lower beds of Bohemia. It is, therefore, important as determining the age of these new rocks. Up to the present time the oldest fossiliferous beds in the district in which these fossils have been found were beds containing coal plants. These, however, are separated from the beds at Boston by a large mass of igneous and metamorphic rocks. Prof. Rogers remarked that the discovery of these fossils confirmed the idea that during the earlier geological epoch there was a more general uniformity in the distribution of organic life than is at present the case. A series of photographs of the specimens was exhibited.

'Fourth Report on the Facts of Earthquakes,' by Mr. R. MALLETT.

'On some Facts connected with Slaty Cleavage and Foliation,' by Mr. SORBY.—Mr. Sorby stated some other conclusions which have presented themselves to his mind regarding the ultimate structure of slate rocks, showing that two orders of structure are detected by the microscope—one referable to pressure on a plastic, the other to pressure on a perfectly rigid, body. He mentioned the systematic presence of mica, varied by quartz, in certain slates, and stated his view of the origin of these two minerals by metamorphism from felspar clay. Experiments on the effects of pressure on plastic and rigid materials were given, and a tabular view of two varieties of structure due to pressure and metamorphism on rocks originally not essentially disimilar.

'On the Relation between the Cleavage of Minerals and the Cleavage of Rocks,' by Prof. KING.—The principal conclusions are, that mineral cleavage is a superinduced structure, the same as rock cleavage; and that rock cleavage is due to the same law, modified, that produced mineral cleavage. As regards what has often been termed slaty cleavage, he considers that there are two kinds—a true and a false one; and he has come to the conclusions—that true slaty cleavage is ordinary rock cleavage, effected by compression applied perpendicularly, or nearly so, to the planes of the latter; and that false cleavage is simply due to pressure applied laterally to the horizontal direction of the planes.

Prof. HAUGHTON exhibited a model illustrative of his views on Slaty Cleavage.

'On the Joining and Dolomitization of the Lower Carboniferous Limestone in the Neighbourhood of Cork,' by Prof. HARKNESS.—The district around Cork consists of a series of hills and valleys,—the former composed of Devonian, and the latter of limestone belonging to the lower position of the carboniferous series. In the latter are joints having three directions: one, the prevailing directions being north and south; and of the other two, one is almost horizontal and the other oblique. These joints occur in great profusion in most of the limestone localities; but in certain spots where the limestone is siliceous and bedded, the jointings are imperfect and the stratification distinct. Among these limestones there are seen in the neighbourhood of Cork dykes of dolomite, and these dykes in jointed limestone conform to the main sandstone joints. In the granite, where the stratification is distinct, we often find, also, dolomites; and these agree with the planes of stratification. The production of these dolomites appears to be subsequent to the deposition of the strata in which they occur. From the observations of Regnault it would seem that sea water (containing sulphate of magnesia) is capable of exciting considerable influence on limestone, giving rise to carbonate of magnesia and sulphate of lime; and the phenomena exhibited by the district around Cork would lead to the inference that sea water, finding access into rocks by joints,

and in some instances along the planes of stratification, so produced the dolomitic masses.

MONDAY.

'On certain Alterations of Level on the Sea Coast of part of the County Waterford, and the Cause thereof,' by Dr. CLARKE.—He described the elevation of an ancient sea beach on the coast of the county of Waterford, extending about two and a quarter miles, and reaching at one part an elevation of 60 feet. He exhibited the Eustacial remains found in it, and stated that it was obviously of the past era, as all its fossil shells had living representatives in the adjoining bay.

'On the Existence of Forces capable of changing the Sea-level during different Geological Epochs,' by Prof. HENNESSY.—If, in assuming its present state from an anterior condition of entire fluidity, the matter composing the crust of the earth underwent no change of volume, the direction of gravity at the earth's surface would remain unchanged, and consequently the general figure of the liquid coating of our planet. If, on the contrary, as we have reason to believe, a change of volume should accompany the change of state of the materials of the earth from fluidity to solidity, the mean depth of the ocean would undergo gradual, though small changes over its entire extent at successive geological epochs. This result is easily deduced from the general views contained in other writings of the author, whence it appears, that if the surface stratum of the internal fluid nucleus of the earth should contract when passing to the solid state, a tendency would exist to increase the ellipticity of the liquid covering of the outer surface of the crust. A very small change of ellipticity would suffice to lay bare or submerge extensive tracts of the globe. If, for example, the mean ellipticity of the ocean increased from $\frac{1}{3}$ to $\frac{1}{2}$, the level of the sea would be raised at the equator by about 228 feet, while under the parallel of 52° it would be depressed by 196 feet. Shallow seas and banks in the latitudes of the British Isles, and between them and the pole, would thus be converted into dry land, while low-lying plains and islands near the equator would be submerged. If similar phenomena occurred during early periods of geological history, they would manifestly influence the distribution of land and water during these periods, and with such a direction of the forces as that referred to, they would tend to increase the proportion of land in the polar and temperate regions of the earth, as compared with the equatorial regions during successive geological epochs. Such maps as those published by Sir Charles Lyell on the distribution of land and water in Europe during the tertiary period, and those of M. Elie de Beaumont, contained in Beaumont's 'Geology,' would, if sufficiently extended, assist in verifying or disproving these views.—This communication was followed by remarks from Mr. HOPKINS and Mr. R. CHAMBERS.

'On the Occurrence of a Boulder of Granite in the White Chalk of the South-east of England,' by Mr. R. GODWIN-AUSTEN.

'Remarks on Geological Observations in India, particularly in Reference to the Erosion of Rivers,' by Herr HERMANN SCHLAGINTWEIT.

'Experimental Researches on the Conductive Powers of various Rocks, and the bearing of the Results upon Theories of Terrestrial Temperature,' by Mr. HOPKINS.

'On the Zoological Relations of the Cambrian Rocks of Bray Head and Howth,' by Dr. KINAHAN.—These rocks can be no longer looked on as azoic, as in these two localities they will be found full of traces of organic life of three types at least. 1st. Zoophytic: Oldhamia, of two species, which occurs in immense beds in Bray, and sparingly at Howth, where it was first discovered by the author in 1857. 2nd. Annelidan: tracks of wandering worms arranged in the same direction as the bedding, found both at Howth and Bray. Worm burrows, vertical to the bedding, and arranged in pairs similar to the Longmynd. Worm tubes of a new type, for which the name of *Histeroderma Hibernicum* was suggested. These are the membranous tubes of a tentaculated worm, which inhabited a trumpet-shaped burrow, bent up at the lower end: this occurs at Bray abundantly in a Cambrian sea beach. 3rd. Molluscan (?) : markings precisely

similar to those so called in the carboniferous slates. These are from Bray. The worm tracks of Howth do not appear to be identical with those of Bray. All the fossils at this latter place would appear to have been deposited in shallow, quiet waters.

TUESDAY.

'On the Geological Survey of Pennsylvania, with Maps and Illustrations,' by Prof. H. D. ROGERS.

'General Sketch of the Districts already visited by the Geological Survey of India,' by Mr. T. OLDHAM, Superintendent of the Geological Survey of India.

'On Carboniferous Limestone Fossils from the County of Limerick, collected by the Geological Survey,' by Mr. W. H. BAILY.—The author in this communication gave a brief notice of an extensive collection of fossils recently made by the Geological Survey in the neighbourhood of Askerton, county of Limerick, which, from its containing several new forms, and the fine state of preservation of many of the specimens, presented points of structure and other peculiarities not before described. The Fauna of the carboniferous limestone period, which is usually one of the richest in zoophytes, in this collection is represented only by a small proportion, principally belonging to the division *Zoantharia tubulata* of Prof. Milne-Edwards, amongst which are the genera Michelena and Chonetes, with the characteristic and extensively distributed coral *Amplexus coralloides*. The Echinodermata, which are most familiar to us in a fossil state, in this collection belong almost entirely to one division of crinoids, the Melocrinida, consisting of numerous detached bodies, principally of Platycrinus and Actinocrinus, almost exclusively confined to this formation. Remains of animals of the class Bryozoa or Polyzoa, now various forms, principally belonging to the family Reteporidae, amongst which are fine specimens of the well-known form *Fenestella membranacea* of Prof. Phillips. Of the Brachiopoda the family Terebratulidae are represented by but one species, the *Terebratula hastata*, of which there is a numerous and fine series. Of the Spiriferidae there are several characteristic species, including *Spirifer Roemerianus* (De Koninck), a form new to Britain, together with the *Athyris Roessyi*, a singular and rare species belonging to this family, in which the lines of growth are developed into expansions, giving it a fringed appearance. Of the family Rhynchonellidae, the common forms of *Rhynchonella pugnus* and *pleurodon*. The Orthidae by the well-known *Orthis resupinata*, and the very rare species *Orthis radialis*, and other well-known forms. Also numerous examples of several characteristic and some rare species of the genus Productidae, including *Productus aculeatus*; and a new species. Of the genus Chonetes there are several interesting and rare varieties, as *Chonetes Koninckii*, new to Britain, *C. variolata* (D'Orb.), and *C. papilionacea*. The Conchifera, or Lamellibranchiata, form a fine series, containing several new forms, amongst them being several species of the genera Aviculopecten and Pteronites (McCoy), shells having an oblique axis like most of the so-called Pectens of the Coal Measures. Of the singular shell called *Conocardium Hibernicum* (Pleurorhynchus of Prof. Phillips) several instructive specimens were collected, showing the expanded keel and siphonal tube, which in some species is still more extended, being probably analogous (as suggested by Mr. T. P. Woodward, in his 'Manual of the Mollusca') to the soft, elongated siphons of a remarkable group of cockles inhabiting the inland salt seas, Aral and Caspian, burrowing in mud. A second species, *Conocardium Koninckii* (U.S.), of which several specimens were collected, some of them attaining a larger size than the *C. Hibernicum*, being remarkably perfect, and having a long siphonal tube. Prof. De Koninck agreed with the author in considering an undescribed form. He proposed, therefore, to dedicate this magnificent species to that distinguished palaeontologist. There are several species of the genus Cardiomorpha, one of which, *C. Koninckii*, is new to Britain,—and another, a new species, of large dimensions. The Gasteropoda, or univalve shells, are also numer-

ously represented by many genera and species, including a new species of *Macrocheilus*, and other undescribed forms. Of the Nucleobranchiata, believed to be allied to the floating shells of the present day, this collection contains several species of *Bellerophon* and *Porcellia Puzio*, a discoidal form of great rarity. The highest order of Mollusca, and most important geologically, are those of the Cephalopoda, which are here remarkable for size and rarity of form, all belonging to the order Tetrabranchiata. The Nautilidae contained many large and fine specimens, some of them being new species. Of the Orthoceratidae specimens were collected of *Orthoceras Muensterianum*, fine examples of *O. dactyliophorium*, and the peculiar forms of *Gomphoceras (Poterioceras) fusiforme* and *Cyrtoceras Verneuilianum*. Of the Goniatites, a division of the Ammonitidae, several species, including *G. crenistria* and *fasciculatus*, alluded to as contained in this collection, some of them showing external markings and others being new forms.

'On a New Fossil Fern, from the Coal Measures near Glin, County Limerick,' by Mr. W. H. BAILY.—The fossil plant alluded to by the author, and of which an enlarged representation was given, was collected by Mr. G. Henry Kinahan, of the Geological Survey, from the black shale above the coal townland of Ballygilteneen lower, county of Limerick, associated with ordinary coal plants. It appeared to be the central portion of a frond, with about twenty alternating pinnules, which are apparently covered by these, or cases of the reproductive germs, presenting an appearance somewhat resembling rows of small flowers. The perfectly unique character of this singular plant, possessing, as it does, a form so totally unlike any recent fossil plant, combined with the rare circumstance in fossil ferns of the carboniferous period, that of bearing organs of fructification, which here appear to be so fully developed, renders it of great interest, and may possibly constitute it a new generic form.

Dr. GLADSTONE read Mr. G. F. Habershon's 'Notes from the Barony Coast, with Fossils.'

'On the Drift of West Galway and the Eastern Parts of Mayo,' by Mr. J. BIRMINGHAM.

'On the Geology of the Neighbourhood of Tralee,' by Mr. F. J. FOOT.

'On the Geology of Caldbeckfells, and the Lower Sedimentary Rocks of Cumberland,' by Prof. HARKNESS.—The district alluded to in this communication forms the northern portion of the mountainous area of the lake district of Cumberland. Caldbeckfells, including their eastern extremity Carrickfell, consist of masses of a plutonic and an igneous nature. On the southern slopes of these hills there is seen Skiddaw slate which generally has a south dip, and this Skiddaw slate as it approximates the granite of Skiddaw Forest, passes into chiastolite slate, chiastolite rock, and a pseudo gneiss. On the south side of the granite area the same phenomena occur, but on this side hornblende rock and actinolite rock also appear. In the metamorphic rocks, and likewise in the ordinary Skiddaw slates which succeed them in position, the strike of the strata is nearly E. and W., and the general arrangement of the strata seems rather to indicate that the plutonic masses of Caldbeckfells form the axis of the group rather than the granite of Skiddaw Forest. With respect to the unaltered rocks of the Skiddaw district, these have been referred by Prof. Sedgwick to three groups—black Skiddaw slate, grits seen in the masses of Grassmoor, and grey Skiddaw slate containing fossils described in the Palæozoic fossils of the Woodwardian Museum. The upper grey slates are the deposits which have hitherto afforded organic remains. Last year the author obtained traces of worms from the black Skiddaw slate, the lowest member of the unaltered series, at Brakeld, and from a communication which the author had recently from Prof. Sedgwick it would appear that in these low strata graptolites have been lately obtained by Mr. J. Ruthven. With regard to the lithological nature of these Skiddaw rocks, it would seem that there is a considerable change according to locality. Westward grey slates, with intercalated grits, obtain on the line of the strike of the black Skiddaw slates, leading to the inference that coarser

beds supply the place of the finer black slates on the eastern margin of the area.

'On some Fossils from the Severn Drift,' by the Rev. W. S. SYMONDS.

'On the Tertiary Clay and Lignite of Ballymacadam, near Caher, in the County of Tipperary,' by Mr. A. B. WINNE.—A short time ago I visited a deposition of white potter's clay and lignite, occurring about a mile to the south-east of Caher, in the county of Tipperary. And in bringing it under the notice of this Section of the British Association, I think it is right to say that I am not the discoverer of it, nor is this the first time it has been noticed, as Dr. Griffith mentioned it in a paper read before the Royal Dublin Society many years ago; still, as I think I can add something to what is already known, and in the hope of eliciting some valuable remarks, or obtaining further information regarding it, I take this opportunity of describing its occurrence partly from what I saw, and partly from the testimony of the people on the spot. This clay is found under and about the ruins of the old castle of Ballymacadam, of which little more than the foundations now remain. The mode of its occurrence is very strange, for when standing in the centre of the small hollow which it occupies, at a distance of about 100 yards, on almost every side the carboniferous limestone may be seen to protrude through the ordinary drift which is spread over the surrounding country, and which, most probably, once covered this isolated basin of tertiary clay, occupying an area of at the most about an acre and a half. Many pits have been sunk within this limit, of which three or four are visible, now filled with water; one small one has been recently opened to the depth of four or five feet, and in this, *in situ*, I found a lenticular mass of lignite, a specimen of which is on the table. The clay is usually white, more or less pure, and sometimes of a dun or bluish tinge, smooth to the touch, and extremely tenacious. The lignite is brown, and occurs in different states of decomposition and alteration, but none of it remains sufficiently perfect to prove what kind of wood it was. I regret to say that time did not permit me to get a section of it examined under a microscope, with the view of ascertaining whether it was coniferous or not. I may here mention a singular circumstance connected with the physical geology of the place. The potter's clay is not in the lowest position in the neighbourhood, but at a slight elevation; and close to it, indeed, within the space it occupies, occur some of those natural drains so common in the mountain limestone of Ireland, expressively called by the peasantry "swallow holes;" these carry off all the surplus water which accumulates in the pits, one in particular having been used to drain them whenever they were opened. From a person who lives at the place, and possesses the right to work these pits, I learned that, having sunk through about fifteen feet of white clay, containing small fragments of plants which unfit it for the manufacture of pipes, a bed of lignite is reached, of varying thickness, from which parts of trees four or five feet in length could be raised without difficulty. Beneath this occurs the purest and best clay, which is white, with sometimes a pale shade of blue, is soft, and has a soapy feel. Lower than it, so far as I could learn, no person has penetrated, the reason assigned being that they either could not afford it, or were prevented by springs of clear water, then bursting upwards through the clay and filling the pits, accompanied by so offensive an odour of sulphuretted hydrogen as could scarcely be endured. Even now the place is not quite free from a mitigated form of this unpleasant circumstance, which, Dr. Griffith informs me, attends the occurrence of potter's clay and lignite in many other places in Ireland, such as at the south-eastern margin of Lough Neagh, counties of Tyrone and Antrim; in the parish of Clonee, in county Tyrone; and near Lough Ree, in Roscommon. With regard to the value of the clay at Ballymacadam, I have heard that it has been sold for as much as 30s. per ton. Of the lowest found clay, which burns white, have been manufactured very good tobacco pipes, and many articles of finer ware, as cups and saucers, &c.; while that above the lignite makes beautiful buff and dun-coloured

tiles; the most inferior of it has been used for bricks, and was at one time as valuable as the best. When used to whiten the cross belts of the soldiers in all the principal inland garrisons of the south of Ireland, quantities of it were at one time exported to England, and it is to be regretted if it is now unworthily neglected. The lignite has been often used as fuel, but it gives forth a heavy and peculiar smell while burning, and is associated with black shales, traces of which I saw near the mouth of one of the pits. Although I looked closely for them, I could not find a single shell in any part of this clay, neither has it been examined for infusoria, owing to want of time.

The following papers were received:—

'On the Geology of Lambay Island,' by Messrs. JUKES and DU NOYER.

'On Fossils from Cultra, near Belfast,' by Mr. M'ADAM.

'On the Skeleton of a Seal from the Pleistocene Beds of Stratheden,'—'Further Notes on the Palæozoic Strata of Scotland,'—'On some New Fossil Forms from the Old Red Sandstone of Scotland,'—'Contributions towards the Restoration of Cephalaspis and its Kindred,' by Mr. D. PAGE.

SATURDAY.

SECTION D.—ZOOLOGY AND BOTANY, INCLUDING PHYSIOLOGY.

Dr. REDFERN described a method of applying the compound microscope to the sides or top of aquaria less than two feet in height. The arrangement consists of a vertical stem, supported by a heavy foot. On the stem a short transverse tube slides vertically and rotates on the axis of the stem, as well as on an axis at right angles to the direction of the stem. This transverse tube carries a long sliding arm, made use of as a lever, with arms of very unequal length. The short arm of the lever terminates in the cup of a ball-and-socket joint. A short stem attaches a tube to the ball, and this tube allows that which carries the objective and ocular to slide through it in coarse adjustment; whilst a fine adjustment is made by acting on the long arm of the lever. The body of the microscope may thus be placed either vertically or horizontally, and placed either over an aquarium or applied to its side with equal ease in the use of the two-inch, one-inch, and the half-inch objectives. For the purpose of illumination, Dr. Redfern employs a small mirror, which is let down into the fluid, and is capable of being moved in any direction by a simple arrangement of brass wires shown to the Section.

'Further Report on the Vitality of the Spongidae,' by Mr. BOWERBANK.—The author stated, that in his former report he had detailed a series of observations on the inhalation through the pores and the exhalation of water through the oscula of a marine sponge, *Hymeniacidon caruncula*, and that he was enabled to determine with certainty the capability which that sponge possesses of opening and closing the oscula at its pleasure, but that he could not in that series of observations satisfactorily determine the nature and powers of the imbibing pores, as those organs can only be seen distinctly in operation in very young and transparent specimens; he, therefore, commenced a series of observations on the action of the pores in young specimens of *Spongilla fluvialis* on the 3rd of October, 1856. He found that in a specimen about half an inch in diameter, which had attached itself to a watch-glass, there was at the summit of a large oval inflation, which varied its form remarkably within a very short time, a single osculum, which opened or closed in accordance with the necessities of the animal, and from which when in full action a powerful stream of water was poured forth. The inhalation of the water by the porous system presented some remarkable peculiarities. When in a state of repose the dermal membrane appeared to be completely imperforate, but when about to commence vigorous inhalent action, a slight perforation appeared here and there over its surface, the orifices gradually increased in size until the full diameter of the pores were attained, and their margin then became thickened and rounded. And if a little indigo be infused in the water, it is seen to be

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absorbed with avidity, and the inhalent action continued for a considerable period, the interior of the sponge becoming strongly coloured by the indigo. After a time the rapid inhalent process ceased, either abruptly or gradually, and a very languid action only remained, and nearly the whole of the pores were closed; when this operation was about to take place, the rounded margin of the orifice lost its form and became thin and sharp, and the circumference gradually melted inwards until the orifice was entirely closed, and not the slightest indication of the organ previously existing remained,—the operation of closing occupying rather less than a minute. When once closed these orifices do not appear to be re-opened, but fresh pores are produced in accordance with the necessities of the animal. The colouring matter absorbed during the period of active inhalation was apparent in the sponge from twelve to eighteen hours, and during this period the stream from the osculum when partially expanded was extremely languid. The author concluded by observing, that the structure and habits of the fresh-water sponges were in perfect accordance with those of the marine species.

The Rev. W. HIGGINS inquired of Mr. BOWERBANK if his researches tended to confirm the view that was ordinarily taken, that the Sponges were of an animal nature.—Mr. BOWERBANK replied, that the points were very numerous in which the sponges agreed with animals and differed from plants. The more he investigated their nature, the more fully was he convinced of the animal nature of these bodies.

'Remarks on certain Genera of Terrestrial Isopoda,' by Prof. J. R. KINAHAN.—These have all been included by M. Edwards under his group Cleptopodidae, but are very imperfectly characterized, and the British species are comparatively unknown. A new arrangement of the genera was proposed, the characters selected as generic being the presence or absence of the so-called "epimerals" of the abdominal rings,—the state of development of the frontal and lateral lobes of the head, the form and characters of the terminal abdominal ring and its appendages, and the form and structure of the filaments of the external antennae. The following arrangement was suggested:—Family, Ligidae; genus, *Ligia* (Brandt); family, Philoscidae; genera, *Ligidium*, *Titranethus* (Schiodte), *Philoscia* (Latreille); family, Steactae, genera, *Trichomitus* (Brandt)? this genus may owe its origin to imperfect means of examination. *Ita* (Koch, in part), this would appear to contain three genera in Koch, one only of which belongs to this division. *Philongria* (Mitr.), *Deto* (Guerin)? *Porcellionides* *Platynarthrus* (Brandt); *Porcellio* (Brandt); *Oniscus* (Latreille); *Armadillidae*; *Armadillo* (Brandt); *Armadillidium* (Brandt); *Sphaerula* (Dana). The other family is Cubaridae, and *Diplochoididae* are not met with in Britain. The species met with in Britain are as follows, those Latinized being new to that country; they are met with in Ireland, except *P. armadilloides*, of which specimens from London are in the British Museum collection:—*Ligia oceanica*; *Philoscia muscorum*; *Philongria celer* (Mitr.); *Philongria*, generic character,—epimerals of abdominal rings, rudimentary, headed, rounded, neither lateral nor frontal lobes, last pair of abdominal false legs uncovered, peduncle branched, external branch of the largest appendages subulate; antennae four; internal antennae rudimentary; external antennae filament subulate, smooth, five-jointed, terminal joint setaceous; *Porcellio scaber* (Brandt); *P. dilatatus* (Brandt); *P. pictus* (Brandt); *P. levii* (Latreille); *P. pruinosus* (Brandt); *P. armadilloides* (Lereboullet); *P. cingendus* (Mitr.),—body elongated, smooth or slightly scabrous, frontal and lateral processes rudimentary only; last abdominal ring triangular, acute at apex; *Oniscus murarius* (Cuv.); *O. fossor* (Koch?) *Armadillidium officinale* (Brandt). All the species are from the neighbourhood of Dublin.

'Notes of a Visit to Mitchelstown Caves,' by Mr. E. PERCIVAL WRIGHT, Director of the Dublin University Museum.—He stated that in company with Mr. Halliday he, in the early part of August, 1857, explored the extensive limestone caverns situated in the valley of Mitchelstown, between the Galtee and the Knockmildown ranges of mountains;

the object of the visit being to examine whether any of the curious blind animals, so well known as inhabiting the Carniola and other caves, would be found in Ireland. Mr. E. Percival Wright gave a brief sketch of the geology of the district, of the various blind insects found on the continent and described by Schiodte, and of the Mitchelstown cave, of which a ground-plan was exhibited; and then stated that in the interior of the cave, and near some small pools of water formed by the dropping from the roof, specimens of a small white Lipura were discovered. This insect comes very near to the species figured by Schiodte, found in Adelbush Cave; but on a very careful examination by Mr. Halliday many differences were detected, more particularly the total absence of ocelli, four of which are figured by Schiodte on each side of the head of his Lipura; but not a trace of ocelli were found in the Mitchelstown Cave specimens. Mr. Halliday observed that there were some other points to which Schiodte's observations, or at least his interpretation of them, were at variance with what is known of the common structure of this family. Hence he was led to hesitate as to the importance to be attached to the differences noted. His Lipura, as well as another species of the family (certainly blind), *Tritonurus scutellatus*, had both been ascertained to have an extensive range in the caves of the Austrian territory, and it did not seem so improbable that they should occur in similar situations even in these islands. The other species found in the Mitchelstown caves having distinct eyes, and the structure of the anal fork agreeing with Macrotroma, could not be confounded with the last-named insect. The list of the proper subterranean Fauna of the European caves (independent of the immigrant animals which occur on the outer world also) had been largely added to since Mr. A. Murray's paper 'On Blind Insects and Blind Vision' was written.—Mr. HALLIDAY submitted a list which, in its turn, would doubtless soon be antiquated by the fresh investigations so diligently pursued by the Austrian naturalists. The present list comprises—Vertebrata, 1; Insecta, 31; Arachnida, 7; Myriapoda, 1; Crustacea, 5; Annelida, 1; Mollusca, 17.—The Rev. Mr. HIGGINS inquired if it were Mr. Halliday's conviction that the blind insects found in these caves were truly species, or not rather insects which had strayed from the light, and, being confined in these caves, lost an organ which was no longer of any use to them.—Mr. HALLIDAY replied that these animals possessed other organs besides eyes which distinguished them as species; and there could be no doubt they had been created for the special circumstances in which they were found.—Dr. HARVEY remarked on the curious fact of many of these caves containing species peculiar to themselves. The same limited distribution of species was found in many other forms of animals. Thus many of the Unios (Mollusca) of the rivers of America were peculiar to the one river in which they were found.—The PRESIDENT of the Association exhibited to the Section a living locust, which had been taken in the grounds of Trinity College, Dublin, a few minutes previously.—Mr. HALLIDAY stated that this was the *Gryllus migratorius*,† the common locust. It was abundant in the East, where it produced great destruction, especially on the borders of the Mediterranean. It was fortunately only an occasional and not a very common visitor in this country. It is eaten by the Arabs. Two different species from this occurred in the interior of Asia and America. When they arrive in this country they do not breed here.

'Note on Peculiarities of Growth in Cecidæ,' by Mr. PHILIP P. CARPENTER.—The Cecidæ are a group of rostriferous Gasteropoda, with shells shaped like Dentalium, and closed by a plug at the posterior end. There are many successive stages of growth, varying in shape and structure, but constant in the form of plug, which is of complex structure, displaying lines of growth from a central or lateral nucleus. As a monograph of the family was in preparation, the author sought opportunities of ex-

† Several specimens of this insect have been taken within the last two weeks in and about London. One was taken in Lincoln's Inn Fields; others have been taken in Manchester.

amining specimens from those who were interested in microscopical inquiries. They were abundant in the sponge of commerce, and lived in the worm-eaten passages of decaying shells.

'On the Embryo State of *Palinurus vulgaris*,' by Mr. R. Q. COUCH, Penzance.—At the time of the publication of Prof. Bell's admirable work on British Crustacea, by some inadvertence the particulars respecting the embryo condition of *Palinurus vulgaris* were overlooked, and up to the present time have not been published. As several years have now passed, and the subject has not hitherto attracted the attention of any other observer, I beg to lay the following observations before the meeting. The metamorphoses of the decapod crustaceans may now be considered as established by observation made in every part of the world. The first announcement of the discovery came from Ireland, from experiments made near Cork by the late Mr. J. V. Thomson. The form under which the young decapods first appeared was announced as belonging to the genus *Zoea*, and all subsequently published observations have confirmed this. But in the species to which I now refer there is an important exception. Lest there should be any error on the matter, I have during the past summer again investigated the point, and have bred many thousands in confinement, and have under the microscope seen them escaping ex ovo, so that there can, in my own mind, be but little doubt on the matter. The young of *Palinurus vulgaris* differs from every other species with which I am acquainted. On escaping ex ovo the different parts are very obscure, from being so closely folded together. But in a few minutes they are sufficiently spread out to become recognizable by a moderate magnifying power. The carapace is globularly oval, and slightly pointed or produced both at the anterior and posterior margin, and is also slightly contracted anteriorly so as to give the appearance of a rostrum. The abdomen is moderately long, and from four of the six annulations of which it is formed arise eight pairs of tendril-like appendages. The lateral margin of each ring is expanded into a thin projecting process, from which the articulated appendages arise. These tendrils are long, slender, and dichotomous. Their double character commences at the third joint, and afterwards they are nearly of equal length, and are covered with strongly marked spines, termination pointed. The caudal extremity is simple, contracted, pointed, and somewhat oval. On the centre of the rostrum is a dark spot. The eyes are on enormously long and stoutly club-shaped peduncles, which are attached by very narrow and slender points. The pedunculated eyes are about two-thirds as long as the carapace. This concise description, with the figures accompanying it, will sufficiently explain the great differences between this and the young of all the other species hitherto described. So general is the *Zoea* form that it has even passed into an expression with investigators of this branch of Natural History, and "the *Zoea* condition" has been considered equivalent to "the Embryo state" in speaking of these creatures. The contrast between the present species and that of others is very great. In them the eyes are sessile, in this enormously pedunculated; in them the feet are beneath the carapace, in this they are attached to what, for clearness, I have called the abdominal rings. Instead, therefore, of belonging to the genus *Zoea*, I would place it in *Phylosoma* of Milne-Edwards, belonging to the Stomopodes.

MONDAY.

'On the Lotus or Sacred Bean of India,' by Dr. BUIST, communicated by Dr. NORTON SHAW.—This plant belongs to the natural order Nelumbiace, and is allied to the water lilies, and is the *Nelumbium speciosum* of botanists. Dr. Buist states that there are three species of this genus at least. The only variety he had observed in India was one with pale rose-coloured flowers, which when full blown, but not open, formed a globe of from 6 to 7 inches in diameter. The leaf is from 14 to 16 inches long, the leaf and flower stalks together from 6 to 8 feet in length. The leaf and flower stalks abound in spiral vessels, which Dr. Wright says are extracted and burnt by the Hindûs in the lamps placed before the shrines of their gods. Dr.

Buist, however, states his conviction that all the spirals of all the lotuses of India, from the Himalayas to the Line, would not make a lamp-wick a yard long the thickness of the finger. The stalks are full of air, the leaves buoyant and floating, the flowers small, like the Tonquin bean. After describing the external appearance and uses of the plant, the author proceeded to describe—1. *The internal structure of the root, flower, and leaf-stems.* The stalks are filled with air, and in their construction care is taken to prevent the percolation or introduction of water. 2. *Repulsion of water from the leaves.* This depends upon the surface of the leaves being covered with a fine fur of silvery hair, like papille, which, when magnified, show themselves in the form of a succession of beads, diminishing in size towards the apex. It is this structure which entangles and retains the air, and thus obtains a high degree of buoyancy. It is the same structure which enables the rose, clover, and young cabbage-leaves, young shoots of grain and grass to exhibit the pearly forms of dew-drops, and to repel water from their surface. The same structure performs the same function in the wings of diving birds. 3. *Respiration of the lotus.* The lotus leaves constantly give out air from their surface, which Dr. Buist has not examined. He found that one plant gave out from a cut stem 33 cubic inches of air in an hour. The greatest quantity of this air was given off two hours after sunrise.

Herr R. SCHLAGINTWEIT read the following 'Notes on some of the Animals of Tibet and India.'—The existence of the Yak, or Tibetan ox, in a wild state, has been repeatedly doubted, but we frequently found wild yaks. The chief localities where we met with them were both sides of the range which separates the Indus from the Sutlej, near the origin of the Indus, and near the environs of Gar-tok; but the greatest number of them was at the northern foot of the high Karakorum range, as well as to the south of the Kuenlun, in Turkistan. In western Tibet, particularly in Ladak, there are no more yaks in a wild state at present, though I have no doubt that they have formerly existed there. They seem to have been extirpated here, the population being, though very thin, a little more numerous than in Thibet in general. As Ladak has been occasionally more visited by travellers than any other part of Thibet, the want of the yak here has probably given rise to the idea that they are no more to be found in a wild state at all. Amongst all quadruped animals the yak is found at the greatest height; it stands best the cold of the Snowy Mountains, and is least affected by the rarefied air. But at the same time the range of temperature in which a yak can live is very limited; the real yak can scarcely exist in summer in heights of 8,000 feet. We often found large herds of wild yaks—from thirty to forty—in heights of 18,600 to 18,900 English feet; and on one occasion we traced them even as high as 19,300 feet,—a remarkable elevation, as it is very considerably above the limits of vegetation, and even more than 1,000 feet above the snow line. The hybrid between the yak and the Indian cow is called Chooboo, and it is very remarkable that the chooboo are fertile. The chooboo, which are most useful domestic animals to the inhabitants of the Himalayas, are brought down to lower places, where yaks do not exist, and where consequently they cannot mix either with yaks or with the Indian cow. We had occasion to see and examine the offspring of chooboo as far as to the seventh generation, and in all these cases we found the later generations neither much altered nor deteriorated; and we were moreover informed that there was never found any limit as to the number of generations. The Kiang, or wild horse, has been often confounded with the Gorkhar, or wild ass, though they differ considerably in appearance, and inhabit countries with very dissimilar climates. The kiang exists in the high cold regions and mountains of Thibet,—the ass in the heated sandy plains of Sindh and Beloochistan. The kiang is found in great numbers nearly in the same localities as the yak; he does not, however, go up the mountains so high as the yak, but the range of his distribution is greater than that of the yak. The greatest elevation where we found

kiangs was 18,600 English feet, whilst we traced yaks as high up as 19,300 feet. The regions where the yak and the kiang are found are, in a zoological point of view, altogether one of the most remarkable and interesting of our globe. The highest absolute elevation coincides here, it is true, with the greatest height of the snow line,—or rather it causes the snow line to be higher. But those large, high plateaus and regions, though free from snow and ice in summer, remain a desert throughout the year. The amount of vegetation on them is less than it is in the Desert between Suez and Cairo, in Egypt. Nevertheless these high, sterile regions are inhabited by numerous herds of large quadrupeds; and besides those already mentioned, numerous species of wild sheep, antelopes, and a few canine animals, chiefly wolves, as well as hares, are abundant. The herbivorous animals find here their food only by travelling daily over vast tracts of land, as there are only a few fertile spots, the greater part being completely barren. The great scarcity of vegetation, particularly the entire absence of mosses and lichens, has a very different effect, though an indirect one, on the occurrence of birds. The small plants are the chief abode of insects, the want of mosses and lichens coinciding with a total absence of humus, limits, therefore, to its minimum the occurrence of insects, the exclusive food of small birds in all extremely elevated parts of the globe, where grains are no more found. We indeed met, travelling twenty consecutive days between heights of 14,000 to 18,200 feet, only with three individuals belonging to a species of Fringilla, but occasionally a few large carnivorous birds, as vultures, were met with. The Gorkhar, or wild ass, an animal, which, as I mentioned before, has been often confounded with the Kiang, or wild horse, inhabits chiefly the rather hilly districts of Beloochistan, part of the sandy plains of Sindh, and it is to be found, if I am not mistaken, to the westward of Beloochistan, in Persia, where it is called Koolan. Dr. Barth lately told me, that, according to the description I gave him, he thinks the asses he saw in Africa identical with the Gorkhars, or wild asses, of Sindh and Beloochistan. I will now try to give an explanation about the fabulous Unicorn, or animal which is said to have one horn only. This animal has been described by Messrs. Huc and Gabet, the famous travellers in Eastern Thibet, according to information they received, as a species of antelope with one horn placed unsymmetrically on his head. When my brother Hermann was in Nepaul he procured specimens of horns of a wild sheep (not of an antelope) of very curious appearance. At first sight it seemed to be but one horn placed on the centre of the head; but, on closer examination, and after having made a horizontal section of the horn, it was found to consist of two distinct parts, which were included in a horny envelope, not unlike to two fingers put in one finger of a glove. The animal when young has two separate horns, which are however placed so close to each other, that the interior borders begin very soon to touch each other; later, by a slight consequent irritation, the horny matter forms one uninterrupted mass, and the two horns are surrounded by this horny substance, so that they appear at first sight to be but one. In conclusion, allow me to say a few words about migratory birds. There are no migratory birds in the Himalayas; we nowhere and at no season found flocks crossing the Himalayas, as many birds of Europe cross the Alps, between Italy and Germany. The Himalayan birds do not change their abodes on a large scale; the different various heights themselves afford them the opportunity to select the climate they require in different seasons. In the plains of India, however, chiefly in Bengal, a large number of birds disappear during the breeding time; they do not, however, leave India altogether, but select their abodes in the lower, impenetrable jungles of the delta of the Ganges and Brahmapootra, called the Sundarbunds, where they were found by my brother Hermann in large quantities, whilst at the same time they had entirely disappeared in Bengal Proper.

The Hon. Mr. GOUGH inquired at what height the Brothers Schlacintweit had observed Grouse in the Himalayas.—Herr HERMANN SCHLAGINTWEIT

replied, that he had observed them at a height of 11,000 feet above the level of the sea.

Mr. BABINGTON read a paper, from Mr. J. Ralfe, 'On the Siliceous Cells formed in the Frustules of Diatomaceæ.'

Prof. T. C. ARCHER delivered in the 'Report on the Products imported into Liverpool from 1851.'—He stated that the Report alluded to was drawn up at the suggestion of Prof. Balfour, at the Glasgow Meeting, in 1855, when Dr. Joseph Dickinson and himself were appointed a Committee for the purpose. At first sight it would appear a very easy matter to draw up a list of the articles imported into any part of this great commercial country; but it would hardly be believed, by those who are unaware of the fact, that no information of this kind can be obtained without the greatest difficulty. Not only do the public statistical accounts fail to afford to the naturalist any satisfactory information, but in many cases they grossly mislead. It was, perhaps, of no great importance that the system of centralization prevented the importations of any particular port being easily ascertained; but it certainly was of the greatest consequence that we should be aware of the sources from which the various materials of the arts and manufactures of this great kingdom were derived. Daily in the port from which Prof. Archer came, articles of the greatest possible interest were brought, which from want of proper information are lost to science and industry. They are placed in the hands of brokers, who, if they are without special information as to their commercial value, reject them as useless, and in all probability they are never heard of again. The means of obviating this difficulty are by no means great, but it might probably be remedied without any, or very little, expense to the country. He gave an example of the way in which drugs are treated. With the exception of a very well-known species, it is the custom to receive all substances intended for medical use under the general head of "drugs unenumerated." This would not really affect the progress of medical science, as far as the common articles are concerned, because they find their way into the ordinary channels of supply; but in the case of new remedial agents being received, they are, for want of knowledge on the part of the broker, too frequently lost. The simple remedy for this evil is, to insist upon specimens of each new importation being transmitted to one or more of our public museums, with the understanding that the directors should, if possible, return the name, so that the article may thus become generally known to commerce. The Report now presented embraced all the articles of the vegetable kingdom imported into Liverpool during the first five years of the present half-century, giving their commercial and scientific names, their natural orders, &c., the ports employed, the country which produced and the country which exported quantities, and general observations on their uses.

Mr. BABINGTON called the attention of the meeting to Prof. Archer's very valuable suggestion that in all our import towns there should be a museum where fresh specimens of any new material of use in the arts and manufactures might be sent.—Dr. LANKESTER called attention to the value of this Report commercially. The Liverpool merchants had refused to have their sons taught the elements of natural science, under the impression that such knowledge was not necessary in commercial pursuits. When they looked at this Report, and apprehended the annual loss that occurred to this country through ignorance of the origin and nature of the materials of our industry, they would probably be more anxious to assist the laudable efforts of Dr. Howson, Prof. Archer, and others, who were endeavouring to introduce into the collegiate establishments of Liverpool instruction in the sciences. He took the occasion to point out the advantages to a manufacturing and commercial community of a knowledge of the nature of those materials in which they worked and dealt.—Mr. G. EMMERSON expressed a wish that Dr. Lankester's remarks should be put into the form of a letter, which might be circulated in the United States of America as well as this country, for he was sure that great annual loss was the result of a

want of knowledge of the elements of the natural sciences.

Mr. LANKESTER read a Report from Prof. Buckman, 'On the Growth of Plants in the Agricultural Garden at Cirencester.'—The Report contained an account of the continuation of the experiments laid before the Association at the Cheltenham Meeting. In the present series of experiments, the reporter believed he had successfully proved that many species of plants regarded as species by botanists were only varieties or hybrid forms. Thus, he had produced *Avena sativa* from *Avena fatua*, *Sympyton officinale* from *Sympyton aspernum*, and many others. He had not succeeded in producing wheat from any species of *Eglops*. He also recorded some experiments on the growth of the potato and other edible plants, as scorzonera, yams, &c.

Mr. BABINGTON stated, that although Prof. Buckman's experiments had been very laboriously performed, he had the conviction that he had not been sufficiently careful in excluding all sources of error as to render his experiments conclusive. No precaution had been taken to prevent the travelling of the plants from one bed to another by seeds or buds, or to prevent hybridization by insects and wind conveying the pollen of one plant to another. Prof. Buckman was more anxious to establish identities than differences, and in his anxiety to do so had actually referred to species which botanists generally did not think existed. His experiments on the conversion of the wild into the common parsnip and the wild into the cultivated oat were very interesting.

'On the Sea Fisheries of Ireland, with reference to their Investigation Practically and Scientifically,' by Mr. W. ANDREWS.—In the course of his paper, he drew attention to the great want of knowledge exhibited by fishermen of the products of the sea. He introduced specimens of a substance which he stated was regarded by the fishermen on the west coast of Ireland as the spawn of the turbot; and wherever this substance was found trawling had been forbidden. All the regulations for fishing were founded upon the evidence and opinions of fishermen; and where these were incorrect, the regulations acted just the opposite to what they were intended to effect.

Mr. J. S. BOWERBANK stated that the specimen just exhibited was not the spawn of a fish, but a not uncommon form of sponge. It had no other relation to fish than this—that where these sponges were found there would Mollusca be found, and where Mollusca abounded fish would be plentiful, so that exclusion from the ground on which this sponge lived would probably be exclusion from a good fishing ground.—Mr. BLOMFIELD stated that he was interested in the fisheries of the coast, and that the local authorities had the greatest difficulty in knowing what rules to enforce upon fishermen, arising out of their prejudices. The trawling fishers and long line fishers always holding diametrically opposite opinions.—Prof. ALLMAN expressed his pleasure at having heard Mr. Andrews's paper. To naturalists, navigators, and fishermen, it was alike interesting and instructive. The register of accurate soundings was of great importance, as depth regulated the distribution of marine life in the same way that height regulated terrestrial life.—Mr. M'ANDREW stated his conviction that cod and ling fed more upon the Mollusca than the Crustacea. That where Mollusca abounded there these fish might be expected. 'Fishing Banks' were not banks, but very variable districts where fish abounded, led there chiefly for the sake of food. From his own dredgings around the coast of Ireland, he believed there were many districts where fish abounded which had not yet been worked at all.—Mr. PATERSON stated that the subject of establishing schools in fishing villages had often been discussed by the late Edward Forbes and Robert Ball. If the children could be taught to observe for themselves, and grow up free from prejudices, the resources of our coasts might be greatly increased. One great evil of all the laws and regulations hitherto issued was, that no one cared to see them put into execution, and the fishermen were, after all, left to their selfishness and ignorance.—Dr. LANKESTER stated that the Committee had that

morning called for a report on the habits of those marine animals which were used as food, in order to enable persons interested in the capture and sale of these animals to carry on their business with the greatest possible advantage.

Dr. REDFERN pointed out numerous inaccuracies in the existing descriptions of *Flustra hispida*, under the names of *Flustra hispida* and *Flustra cariosa*,—referring especially to the facts that no spines are ever to be found on that side of the aperture of the cell next its base; and that whilst in specimens gathered in Kincardineshire the spines are placed on the septa all round the cells, in those gathered in Dublin Bay the spines for the most part form a semicircle over the aperture, two or three only being found on the sides of the cell in rare instances. The Doctor then described the structure of the polypide after its removal from the cell, and its development by germination, describing its various stages from day to day, as it grew from a mere projection on the wall of the original cell, up to a complete cell with its spines and fully protruded polypide. The various characters of the perfectly formed zoophyte, with its cells set with spines; the most prominent features of its anatomical structure, and the growth of the new being from day to day by germination, were illustrated by a series of coloured drawings made by the author with the camera lucida; and microscopic preparations exhibited to the Section showed the characters of the cell, and of the polypide after its removal.

SATURDAY.

SUB-SECTION D.—PHYSIOLOGICAL SCIENCE.

President—Dr. R. HARRISON.

Vice-Presidents—Sir H. MARSH, Prof. HUGH CARLISLE, Prof. F. C. FAYE, Christiania, Dr. JACOB, Dr. LAYCOCK, Sir PHILIP CHAMPTON.

Secretary—R. D. LYONS, Prof. REEDER.

Committee—Dr. Banks, Dr. J. B. J. K. Barton, Dr. J. Black, Dr. Carte, Dr. Churchill, Dr. Corbett, Dr. J. C. Draper, Dr. W. T. Gairdner, Dr. Gordon, Dr. Griffin, Prof. Hayden, Dr. J. Hughes, Dr. Kinahan, Dr. Law, J. Lester, Dr. R. McDonald, Dr. W. C. Moore, Dr. Osborne, Dr. Poznanski, Dr. Steele, Dr. W. H. Thompson, Dr. Tyrell.

This Section met at 11 o'clock in the Law School, Prof. Harrison, M.D., President, in the chair.—The PRESIDENT said that it would be in the recollection of several persons present, that in the year 1835, when the British Association met first in Dublin, a Physiological or Medical Section had been formed and had worked with great success, and that many most important additions to science had emanated from its labours at the meeting. Since that period, however, at the meetings of the Association, which took place in the principal towns throughout the empire, no Physiological Section existed, nor indeed had it been originally intended in the arrangements for the present meeting in Dublin to establish any such Section as a distinct one. It had been found, however, that many distinguished scientific medical men had assembled in the city, representing not merely England and Scotland, but several of the Continental countries, and even America, and it was determined, even at the present late hour, to organize a Sub-section, in which the labours of these eminent medical men could be made available for the promotion of science, and he (Prof. Harrison) was happy to congratulate the meeting on the distinguished array of gentlemen now assembled in this room.

Prof. LAYCOCK, of Edinburgh, read an abstract of a paper, written by Prof. Alison, of Edinburgh, 'On certain *a priori* Principles of Biology.'—The writer stated that there were certain principles which should be admitted, and that they formed the same basis for physiological science as the axioms of geometry did for that science, and as certain inductive principles for the science of morals. It might be said that the object of the paper was to apply the doctrine of the Scotch school of metaphysics to physiological science, but on account of the recent illness of the distinguished author the communication was incomplete.

Dr. GAIRDNER, of Edinburgh, as a pupil of Prof. Alison, explained the nature and object of his distinguished preceptor's views, which he said were chiefly directed to oppose the modern tendency of medical investigation, which he regarded as likely to degrade the science to that of a subordinate department of chemistry on the one hand, and of mechanical science on the other, omitting all consideration of that high though less intelligible class of phenomena which were known to be vital.

The ABBÉ MOIGNO made a communication in French on the part of M. le Baron Heurtelous, 'On a new Method of administering Chloroform.'

'On the Connexion between Atmospheric Vicissitudes and Epidemic Diseases,' by Dr. POZNANSKI.—He also exhibited an instrument for measuring the force and number of the pulsations of the arteries.

'On the Oriental Bath,' by Dr. HAUGHTON.—This paper led to a general discussion on the effects of bathing on health, and a general opinion was expressed that the price charged at the public baths of this country was still too high to allow of that free use of bathing which was essential to the preservation of health and morals.

'On the Physiological Relations of Albumen,' by Prof. HAYDEN.

'On the Mortality from certain Diseases,' by Dr. GAIRDNER.—The object of the author was to obtain a more accurate account of the causes of death, especially in our hospitals, than yet obtained by the reports afforded by those institutions. In the course of his remarks Dr. Gairdner commented upon the returns of the Registrar-General, and stated that for the purposes of medical science they were not only utterly useless, but misleading and injurious.

MONDAY.

'On the Alternation of Generations and Parthenogenesis in Plants and Animals,' by Dr. LANKESTER.—After alluding to the phenomena of 'Alternation' as described by Steenstrup in the Entozoa, Meduse, and Sertularian polyps, and to the phenomena of Parthenogenesis, described by Owen and Von Siebold, the author concluded his paper as follows:—"If we turn now to the vegetable kingdom, we find perfectly analogous phenomena presenting themselves. In fact, the modifications of the reproductive function, which have recently excited so much surprise in the animal kingdom, are the normal forms of the function among plants. In the roots and branches of a tree we have a gigantic 'nurse,' and the buds are its progeny. Just as we find the same secondary products called 'gemmae,' in animals either remaining adherent to their parent-stocks, as in the Sertularian and other zoophytes, or floating off, as in Hydra and many others, so we find the buds of plants remaining attached to the tree, or becoming separated from it. Just, too, as we find a different form assumed by the secondary offspring of the 'nurse,' as in the scolex-head of the cystic-worm, so we find in such cases as those presented by the 'bulbillus,' the 'bulb,' and the 'sporule,' different forms assumed by parts having the same relations in the plant as in the animal. So likewise in the plant we find a greater change of the secondary offspring taking place, when sexes are developed and flowers are produced, and the hermaphrodite flower, with its stamens and pistils, is the representative of the segments (proglottides) of the tape-worm, with its male and female apparatus in a common envelope. We may go yet further with our analogies in the vegetable kingdom. Here also we have numerous cases in which the germ-cell, the ovule, is produced, and develops within itself an embryo, quite independent of the influence of the sperm-cell, the pollen."—The paper was illustrated by the following diagram:—

GENESIS.

<p>HOMOGENESIS. (Reproductive force acting through similar cells.) It is represented in—</p> <p>A. Plants by Phytopods.</p> <ol style="list-style-type: none"> 1. Isophytopods. Buds. 2. Allophytopods. Bulbils. Bulbs. Sporules, &c. <p>B. Animals by Zoids.</p> <ol style="list-style-type: none"> 1. Isozoids. Gems, or buds. 2. Allozoids. Nurses (Steenstrup). Agamozooids (Huxley). Virgin Aphides (Owen). Agamic eggs (Lubbock). Drone Bees (Siebold). 	<p>HETEROGENESIS. (Reproductive force acting through dissimilar cells, sperm-cells and germ-cells.) It is represented in—</p> <p>A. Plants by</p> <ol style="list-style-type: none"> 1. Gynophytopods. Female flowers. Pistillidia, &c. 2. Androphytopods. Male flowers. Antheridia, &c. 3. Androgynophytopods. Hermaphrodite flower. <p>B. In animals—</p> <ol style="list-style-type: none"> 1. Gynozoids. Females. 2. Androzooids. Males. 3. Androgynozoids. Hermaphrodites.
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'On the Advantages arising from the Improvement of Tidal Rivers as exemplified by the State of the Clyde,' by DR. STRANG.—Though the area drained by the river above Glasgow is 736 square miles, and sends down water in floods to the extent of 33,885 cubic feet per second, it remained in a state of nature till 1768, having only about two feet depth of water. By different engineering appliances it has been rendered navigable for vessels drawing twenty feet of water. This has been accomplished, first, by placing jetties on its sides, whereby to contract the stream and cause it to deepen itself by its own flow and scour; this obtained a depth of 8 feet; secondly, by connecting these jetties by half-tide parallel dykes, a depth of 10 feet, and thereafter by raising them to full-tide dykes, a depth of 11½ feet; thirdly, by the combined processes of dredging and steam navigation prior to 1839, which augmented the depth to 15 feet; and, fourthly, by the combined action of the dykes, deepening machines, and steamboat traffic, an artificial river has been got at this moment of a depth of 18 feet water at neap, and 20 at spring tide. With respect to the harbour of Glasgow, its changes had been equally marked. In 1800, the whole quay was limited to a few hundred yards; now it extends to about two miles and a half, leaving an extent of harbour of upwards of 60 acres. From these causes the number of vessels arriving at the harbour of Glasgow has increased from 11,505, with a tonnage of 696,261, in 1828, to 17,960, with a tonnage of 1,612,681, in 1857. While in 1828, there was not a steamer above 100 tons at the harbour, now such vessels as the *Persia* of 3,600 tons sail down the river. The cost of the vast improvements made from 1770 to July, 1856, has been 2,527,199*l.* The revenue collected during the same period has been 1,603,219*l.*, the annual revenues being in 1771, 1,046*l.*; in 1857, 82,797*l.* The debt of the Clyde Trust is about 92,000*l.*, consequently a large portion of what may be called real capital has been paid out of revenue. The following commercial results may be mainly attributed to the improvement of the Clyde navigation. Before these operations were begun, Glasgow had little or no trade, whereas in 1854 the aggregate value of exports from its harbour was 4,905,557*l.* Previous to 1801 her registered ships were *nil*; in 1856 they amounted to 563, with a tonnage of 204,331. Formerly no ships were built on the river; now there are no fewer than 30 large ship-building yards, which in 1853-4 constructed no less than 266 vessels, having an aggregate tonnage of 168,000 tons, which, with the marine-engines made during the same period, involved the enormous cost of nearly 5,000,000*l.* sterling. Previous to the commencement of the river improvements Glasgow had only 24,000 inhabitants; now she can count 420,000, whilst its annual rental, which in 1750 was only a few thousands, was last year 1,819,720*l.* The improvements on the Clyde have given a most decided impulse to the opening up and working of the rich fields of minerals by which Glasgow is surrounded, and which produced in 1855 from coal and iron alone nearly 4,900,000*l.*, and gave employment to 233,912 persons, who received for their labour wages to the amount of 1,975,919*l.* So much for Glasgow. In a national point of view these improvements have proved equally beneficial. In 1796 the Customs duties levied at Glasgow were only 125*l.*, whereas last year they amounted to 718,855*l.* In 1781 the revenue of the Glasgow Post-office was only 4,341*l.*; in 1856, with a penny postage, it reached 64,958*l.* In one word, while the taxes paid into the public treasury through the city of Glasgow before the Clyde improvements commenced were, comparatively speaking, nothing, the various crown revenues collected there last year reached no less a sum than 2,800,000*l.*, or about 1-25th part of the whole revenue of the country.

'On the Statistics of Crime in Ireland from 1842 to 1856,' by MR. J. M. WILSON.

'On Competition at the Bar,' by PROF. LESLIE.

'On Professional Incomes,' by the same.

MONDAY.

'On the Economical, Educational, and Social Importance of open and public Competitive Examinations,' by MR. E. CHADWICK.

'On the Necessity of prompt Measures for the Suppression of Intemperance,' by MR. J. HAUGHTON.

'On the Effect of good and bad Times on Convicts to Prison,' by MR. H. CLAY.

'On the Dependence of Moral and Criminal on Physical Conditions of Populations,' by MR. E. CHADWICK.

'On the Influence of inadequate or perverted Development in the production of Insanity, Disease, Want, and Crime,' by DR. H. M'CORMAC.

'On Criminal Statistics,' by MR. J. C. SYMONS.

'On the Census of Sydney, New South Wales,' by MR. H. J. PORTER.

'On the Application of the Decimal Scale in the Construction of Maps,' by MR. J. YATES.

'On the Use of Prime Numbers in English Measures, Weights, and Coinage,' by the same.

SATURDAY.

SECTION G.—MECHANICAL SCIENCE.

The Earl of Rosse, President, took the chair at eleven o'clock.

Continued 'Report on the Development of Heat in Agitated Water,' by MR. G. RENNIE.—MR. Rennie, in alluding to his former papers on the subject, read before the Section last year, at Cheltenham, stated that the subject of the mechanical or dynamic force required to raise a given quantity of water one degree of Fahrenheit had long been the object of the research of philosophers, even since Count Rumford, in his celebrated experiments on the evolution of heat in boring guns when surrounded by ice or water, proved the power required to raise one pound of water one degree, and which he valued at the dynamic equivalent of 1,034*l.* M. Moya was the first who announced that heat was evolved from agitated water. The second was Mr. Joule, who announced that heat was evolved by water passing through narrow tubes, and by this method each degree of heat required for its evolution a mechanical force of 770*l.* Subsequently in 1845 and 1847 he arrived at a dynamical equivalent of 772*l.* These experiments had since been confirmed by other philosophers on the Continent. In the present paper MR. Rennie stated that his attention was called to the subject by observing the evolution of heat by the sea in a storm, by the heat from water running in sluices. He, therefore, prepared an apparatus similar to a patent churn, somewhat similar to that adopted by Mr. Joule, but on a large scale. In the first case he experimented on fifty gallons, or 500*l.* of water, inclosed in a cubical box, and driven by a steam engine instead of a weight falling from a given height, as in Mr. Joule's experiment; secondly, on a smaller scale, by 10*l.* of water inclosed in a box. The large machine or churn was driven at a slow velocity of eighty-eight revolutions per minute, and the smaller machine at the rate of 232 revolutions per minute, so that the heat given off by the water in the large box was only at the rate of three and a half degrees per hour, including the heat lost by radiation; whereas the heat evolved by the ten gallons of water contained in the small box agitated at 232 evolutions was fifty-six degrees Fahrenheit per hour. Thus the temperature of the water in the large box was raised from sixty degrees to 144 degrees, and the temperature of the water in the small box to boiling point. As an illustration, an egg was boiled hard in six minutes. The mechanical equivalent in the first case was found to approximate nearly to that of Mr. Joule, but in the latter case it was considerably above his equivalent, arising, very probably, from the difficulty of measuring accurately the retarding forces.

'On the Form of Entrances to Tidal Basins,' by MR. B. STONEY.—On examining the entrances of the numerous floating docks and tidal basins which had been constructed up to the present period, it was found impossible, owing to the great variety of their form, to reduce the principles upon which they appeared to have been constructed to any one definite or precise rule. Some dock entrances were formed at right angles to the river, a few sloping upwards against the stream, and others again sloping downwards, which latter form not only tends to prevent deposits, but greatly facilitates the entrance and departure of vessels. He objected to the

entrance being at right angles to the stream, on the ground that, though equally adapted for vessels coming from the interior of the country or from the sea, the number of vessels which entered a dock from the upper part of the river bore a very small proportion indeed to those whose traffic was seawards. It was usual to place the entrance at or near the centre of the dock or basin, which was parallel to the river; but when the entrance was thus placed, vessels lying at either side of the entrance had to be warped, at a considerable expense of time and labour, into a suitable position for passing through. The chief points to be aimed at in constructing a dock or tidal basin were—1. Facility of ingress or egress. 2. Freedom from silting up. To these may be added—3. Economy of quay room; and 4. Facilities for the land traffic in connexion with the shipping. These requisites were, he believed, in a great measure fulfilled in the form of basin and entrance which he now advocated, viz., a lozenge, or trapezium, or rectangle, whose width was equal to the breadth of two vessels together, with sufficient space between them for another vessel to turn with facility, say from 350 to 400 feet between the walls for vessels of ordinary length. The entrance was at the lower end, and sloped so that a ship or steamer could pass from the river into the dock without warping, or any such annoyance and delay. Similarly on leaving, a vessel, when once her head was turned round, could pass through with as much ease as at entrance, and without risk of being carried by the current against the lower pier head.

'On Macadamized Roads,' by MR. FRITH.

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MONDAY.

MR. J. SCOTT RUSSELL, Vice-President, in the chair.

'Report on the Collapse of Tubes,' by MR. W. FAIRBAIRN.

MR. J. C. DENNIS, of London, read a paper from MR. J. HARTUAPP, 'On Controlling the Movement of Ordinary Clocks by Galvanic Currents.'

MR. WRIGHT read a memorandum, by ADMIRAL MOORSOM, 'On the Want of Facts respecting the Performance of Vessels at Sea.'—The Admiral expressed his opinion that if experiments were conducted at sea under a vast variety of conditions as to form, size, and circumstances, rules might be established which would serve to determine much of what was now the subject of controversy, and go far to remove the reproach on the greatest maritime nation of the world, which was contained in the following passage of a work by MR. SCOTT RUSSELL:—"It is admitted that out of every three steam-vessels that are built, two fall very far short of fulfilling the intention with which they were constructed."

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